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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Attorney Docket No. US010673

Applicant:

Charles TRUSHELL et al.

Title:

CONTAMINANT GETTER ON UV REFLECTIVE BASE

COAT IN FLUORESCENT LAMPS

Appl. No.:

10/017,360

Filing Date:

December 14, 2001

Examiner:

K. Guharay

Art Unit:

2879

Board of Patent Appeals and Interferences United States Patent & Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450

APPEAL BRIEF

Sir:

This Appeal Brief is timely filed following a Notice of Appeal filed November 3, 2004, an Advisory Action dated September 22, 2004, and a Final Office Action mailed on August 11, 2004. Under the provisions of 37 C.F.R. § 41, this Appeal Brief is being filed together with a transmittal that includes an authorization to charge the amount of \$500.00 covering the 37 C.F.R. § 41.20(b)(2)(ii) fee for filing of the Appeal Brief. If this fee is deemed to be insufficient, authorization is hereby given to charge any deficiency (or to credit any balance) to deposit account 19-0741.

(i) REAL PARTY IN INTEREST

The real party in interest is the assignee, Koninklijke Philips Electronics N. V. having a place of business at: Groenewoudseweg 1, 5621 BA Eindehoven., NL as indicated by the assignment recorded at Reel/Frame 012389/0678.

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(ii) RELATED APPEALS AND INTERFERENCES

No other appeal or interference that would directly affect or be directly affected by or having a bearing on the Board's decision with this appeal exists.

(iii) STATUS OF CLAIMS

Claims 1-24 are pending in this application. Claims 1-16 and 21-24 stand rejected. Claims 17-20 are withdrawn from consideration. The rejection of claims 1-16 and 21-24 is appealed.

(iv) STATUS OF AMENDMENTS

The claims 1-16 and 21-24 stand as they were finally rejected. It should be noted that in the Advisory Action dated 09/22/04, at # 7, it is indicated that the proposed amendment(s) will not be entered for the purposes of appeal. However, this is in error. No amendments were proposed in the after final response submitted to the PTO on September 2, 2004.

(v) SUMMARY OF THE CLAIMED SUBJECT MATTER

As set forth on page 1, lines 2-8, the invention relates to low-pressure mercury vapor lamps, more commonly known as fluorescent lamps, having a lamp envelope with phosphor coating, and more particularly, to such lamps in which the amount of contaminants introduced into the lamp during manufacture are reduced during lamp operation. This has the effect of reducing mercury consumption, improving maintained light output and improving arc stability at time of lamp ignition.

At page 2, lines 16-20, it is disclosed that "it has been found that the large surface area of the particulate base-coat combined with the propensity of aluminum oxide to adsorb gaseous molecules results in larger than normal amounts of contaminants being introduced into the lamp interior during manufacture." It is respectfully submitted that the claimed arrangements present structure which resolve this problem.

The claimed subject matter is directed, in a first independent claim, to an electric lamp (1), consisting essentially of:

- a) a lamp envelope (bulb 3) having an inner surface (15 see figure);
- b) means within the lamp envelope for generating ultraviolet radiation (5, 6,
- 9, 10, 11; Mg; rare gas; see page 1, lines 10-17, page 2, lines 2-15, page 7, lines 2-20);
- c) a layer of a luminescent material (phosphor coating 17; figure; page 9. line 8 page 10, line 11) adjacent the inner surface (15) of the lamp envelope (3) for generating visible light when impinged by said ultraviolet radiation; and
- d) a reflective layer (undercoat 16, page 4, line 16 page 5, line 9; page 7, line 20 page 8, line 14; page 9, line 8 line 22), said reflective layer being disposed between said inner surface (15) of said lamp envelope (3) and said layer of luminescent material (17), for reflecting ultraviolet radiation which has passed through said layer of luminescent material (17) back into said luminescent material for increasing the visible light output of said luminescent material, said reflective layer (16) consisting essentially of a mixture of particulate non-fluorescent oxidic material (aluminum oxide) and a getter material (page 5, lines page 6 line 16; page 7 line 20 page 8, line 7 page 9, line 22) comprising a thermally decomposed getter precursor (page 5. line 10 page 6 line 16, page 9 lines 8-22) which reacts with contaminants present in the lamp, said getter material being formed upon thermal decomposition (page 5, line 10 page 6, line 2) of the getter precursor material during lehring (sintering).

The claimed subject matter is also directed, in a second independent claim to a low pressure mercury vapor fluorescent lamp, comprising:

- a) a tubular, light transmissive lamp envelope (3) having opposing sealed ends and an inner tubular surface;
 - b) a filling of mercury and a rare gas;
- c) a pair of discharge electrodes (5) each arranged at a respective sealed end of said lamp envelope;
- c) means (contacts 13, lead in lines 7, 9, glass press seal 11) for connecting said discharge electrodes (5) to a source of electric potential outside of said lamp envelope, whereby during lamp operation a gas discharge is maintained between said discharge electrodes, which gas discharge emits ultraviolet radiation;

- d) a single reflecting layer ((undercoat 16, page 4, line 16 page 5, line 9; page 7, line 20 page 8, line 14; page 9, line 8 line 22)) disposed on said inner surface (15) of said lamp envelope (3), said single reflecting layer (16) consisting essentially of a sintered mixture of an aluminum oxide material (page 7, line 20 23) and a getter material (page 5, lines page 6 line 16; page 7 line 20 page 8, line 7 page 9, line 22) which reacts with contaminants present in the lamp; and
- e) a layer of luminescent material ((phosphor coating 17; figure; page 9. line 8 page 10, line 11) disposed on the single reflecting layer (16).

(vi) GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The sole grounds for rejection that is presented for review is that wherein the Examiner has rejected claims 1-16 and 21-24 under 35 USC § 103(a) as being unpatentable over Trushell in view of Kaduk et al.

(vii) **ARGUMENTS**

Examiner has erred in rejecting claim 1-16 and 21-24 under 35 USC § 103(a) as being unpatentable over Trushell in view of Kaduk et al.

The hypothetical person of ordinary skill would <u>not</u> be motivated to consider a transfer of teachings between the cited references when the two references are <u>both</u> <u>considered as a whole</u>.

More specifically, in this rejection, the Examiner admits that Trushell <u>fails</u> to disclose a <u>reflective</u> layer in which a getter material is mixed with a UV reflective oxidic material. To overcome this acknowledged shortcoming, the Kaduk et al. reference was cited. The Kaduk et al. reference is relied on as disclosing an <u>undercoat</u> layer containing UV reflecting material of alumina particulate as in Trushell's device together with a getter material comprising a thermally decomposed getter precursor, MgO, for gettering action on the gas fill in the lamp. In support of this position, the rejection cites column 3, lines 1-24, of Kaduk et al.

However, appellant's submit that, in order to establish a *prima facie* case of obviousness, it is necessary to show that the hypothetical person of ordinary skill would, without any knowledge of the claimed subject matter and without any inventive activity,

be motivated to arrive at the claimed subject matter given the guidance of the cited references when each is <u>fully</u> considered as statutorily required. It is respectfully submitted that the Examiner has failed to meet this burden.

Appellants further submit that there are three possible sources for motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. *In re Rouffet*, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998) This case law, however, establishes that, even if the combination of the references may possibly teach every element of the claimed invention, without a motivation to combine, a rejection attempting to establish a *prima facie* case of obvious must be held improper. Additionally, the level of skill in the art cannot be relied upon to provide the suggestion to combine references. *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999).

The motivation to combine advanced in the final rejection is alleged to be that the <u>undercoat</u> layer of Kaduk et al. will provide gettering action on the gas fill of the lamp. Indeed, the final rejection states "it would have been obvious to one having ordinary skill in the art at the time the invention was made to mix a getter material in the undercoat layer, as disclosed by Kaduk et al., in the device of Trushell, [sic] such undercoat layer will provide reflection of light as well as gettering action on the gas fill of the lamp."

Using a problem and solution analysis of the Trushell arrangement, it is noted that there is an absence of any suggestion in the Trushell disclosure that a getter needs to be added. In addition, the Trushell arrangement utilizes an undercoat which is an agglomerated particulate matter <u>predominantly</u> of <u>gamma alumina</u> having a primary crystallite size of less than 0.05µm, which is taught by the Kaduk et al. reference (discussed below) to be minimized. At column 3, lines 44-54, the Trushell reference sets forth that:

Accordingly, it was a **surprise** to find that the **undercoat** according to the invention **increased lamp lumens** as compared to a lamp with the identical phosphor layer and no pre-coat. This was particularly surprising in view of the fact that (i) Applicants base **consists of gamma alumina**, which Arai teaches is ineffective for increasing light output, and (ii) the grain size according to the present invention is

smaller than that which Arai teaches is effective.

Specifically, the **particle size** of about 0.01 µm according to the one embodiment is about five times smaller than Arai lower limit for effectiveness. (Emphasis added)

Clearly, it is the <u>size</u> and <u>form</u> of the crystalline material which are features of the Trushell arrangement. Indeed claim 1, of this reference recites (and therefore teaches the reader) that the ultraviolet reflecting material comprises an agglomerated particulate material of <u>predominantly gamma alumina</u> having a primary crystallite size of less than about 0.05 µm; and that this ultraviolet reflecting layer of <u>predominantly gamma alumina</u> has a weight/surface area of between about 0.15 mg/cm² and about 0.30 mg/cm².

Kaduk et al. on the other hand, discloses forming a MgO/Al₂O₃ mixture of <u>about 99.1% MgO</u>, 0.5% of Al₂O₃ and 0.4% Sb₂O₃. Since the Trushell layer is required to be <u>predominantly</u> Al₂O₃, it is submitted that there is an <u>immediate dilemma</u> in that the MgO containing layer of Kaduk et al. is disclosed as being <u>predominantly</u> formed of <u>MgO</u> and such as to contain <u>only a small</u> amount of Al₂O₃. An accurate transfer of the teachings of Kaduk et al. to Trushell could therefore be fully expected to reduce the amount of Al₂O₃ (which is disclosed in Trushell as being responsible for the surprising increase in lumens) in the Trushell undercoat to the point that the concept on which the Trushell arrangement is based, could well be negated.

"If the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)." M.P.E.P. § 2143.01.

Alternatively:

"If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)." M.P.E.P. § 2143.02.

It is also submitted that arbitrarily adding MgO in the manner suggested in Kaduk et al. is very apt to produce detrimental results. Indeed, the Kaduk et al. reference does not suggest to arbitrarily add just a dash (a small amount) of MgO to a layer which is predominantly formed of Al₂O₃ (which verily appears to be the Examiner's position). Instead it suggests to make the layer mostly MgO. Thus, apart from introducing the clear possibility of reducing the amount of Al₂O₃ dramatically to the point where the Trushell arrangement could very well be rendered inoperative (note the above noted disclosure of surprisingly increased lumens being produced using a layer which is predominantly gamma alumina), issues arises as to how the particles of MgO will modify the effect of the gamma alumina of Trushell; what particle size should the MgO particles be in light of the size and effect of the gamma alumina disclosed in Trushell; and is there any crystalline form that can be expected to have no detrimental effect on the unexpected benefits of the gamma alumina used in Trushell?

In re Keller (642 F.2d 413, 208 USPQ 871 (CCPA 1981)) states that "the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference, nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the <u>combined teachings</u> of the references would have suggested to those of ordinary skill in the art."

Indeed, in the Advisory Action dated September 22, 2004, the Examiner quotes *In re Keller* and relies on this case law to justify the erroneous position that it is ok to selectively leave out (*viz.*, ignore) features of one reference when considering a transfer of teachings from one reference to another. Presumably this is the justification for apparently ignoring all of the teachings of Kaduk et al. including the high concentration of the MgO which Kaduk et al. discloses vis-à-vis the high concentration of gamma alumina required in Trushell.

The ramifications of this position are also reflected in the position expressed in the Advisory Action (September 22, 2004) wherein the Examiner has justified selectively ignoring the teachings pertaining to the reflective layer of Kaduk et al. That is to say, Kaduk et al. has both an undercoat <u>and</u> a reflective layer. The rejection fails to establish a reason why the hypothetical person of ordinary skill would not also consider a transfer

of teachings of the reflective layer of Kaduk et al. to the arrangement of Trushell, and why the teachings of the reflective layer of Kaduk et al. are <u>selectively ignored</u> in favor of those pertaining to just the undercoat. In a nutshell, the rejection simply (and improperly) ignores the presence of the second layer and the teachings in Kaduk et al pertaining to the same.

More specially, column 4, lines 51-59 of Kaduk et al. it is disclosed that:

While it is not fully understood how the invention functions to improve lamp performance, it is believed that the undercoat may have a gettering action on the gas fill in the lamp, and also improves reflectivity by reflecting some of the light which otherwise would escape through the TiO₂ reflector coating (which is not a perfect reflector), and also tends to reduce mercury deposition in the phosphor and on the TiO₂ reflector coating. (Emphasis added)

Thus, Kaduk et al. admits that there is some uncertainty as to the gettering action of the MgO, and further contains a suggestion that it is a combination of the TiO₂ layer (which reflects light) and the undercoat (which also reflects some light) that is important since it is believed to be the basis of the improved reflectivity provided. Thus, a transfer of teachings from Kaduk et al. to Trushell without the inclusion of the TiO₂ layer would amount to ignoring a clear suggestion that there is a combination effect provided by the two layers which should be considered. Accordingly, it is submitted that the transfer would not be made without clear teachings/suggestions to omit the TiO₂ layer.

Further, it is clear that a transfer of teachings of the undercoat of Kaduk et al. to Trushell, as per the alleged motivation for combination, would basically obliterate the Trushell undercoat and basically convert it from predominantly Al₂O₃ to predominantly MgO, and would have to be made in view of the <u>admitted uncertainty</u> that the MgO "may" (or may not) "have a gettering action."

Additionally, as noted above, the guidance of Kaduk et al. would induce the hypothetical person of ordinary skill to strongly consider the TiO₂ layer as part and parcel of the teachings of Kaduk et al. and thus demand that the TiO₂ layer be transferred along

with the teachings of the getter material. However, claim 1 is set forth in <u>partially closed</u> <u>format</u>, so that the introduction of the TiO₂ layer would violate the requirement that anything in addition to the recited materials be such as to <u>not have any material effect</u> on the novel characteristics of the claimed invention. Clearly, the presence of the TiO₂ layer and the reflective properties associated therewith would <u>materially</u> effect the properties of the electric lamp which is being claimed.

The TiO₂ layer must therefore be excluded from the claimed combination. This exclusion, of course, additionally renders it impossible for an accurate transfer of teachings from Kaduk et al. to those of the Trushell reference.

A further shortcoming in the rejection resides in that the claimed invention is based on the discovery of the problem which is not recognized by the art. As noted above, at page 2, lines 16-20 of the instant specification discloses that "it has been found that the large surface area of the particulate base-coat combined with the propensity of aluminum oxide to adsorb gaseous molecules results in larger than normal amounts of contaminants being introduced into the lamp interior during manufacture."

It is respectfully submitted that the claimed arrangements present structure which resolve this problem.

In re Nomiya (CCPA) 509 F.2d 566; 1975 CCPA LEXIS 185; 184 USPQ (BNA) 607 established that, if a person of ordinary skill in the art, at the time of the invention, would not have expected the problem which was overcome, to have existed, then in light of this absence of any knowledge of the problem in question, it was not proper to conclude that the claimed subject matter would have been obvious to the hypothetical person of ordinary skill in the art.

That is to say, none of the cited references recognize the problem wherein the particulate Al_2O_3 is the culprit which adsorbs the unwanted gaseous molecules. Therefore, there is nothing to suggest the structure which results from sintering an aqueous suspension of aluminum oxide and a soluble precursor of a zinc or an alkaline earthy metal oxide. More specifically, due to the inevitable dispersion of the soluble precursor in the suspension, when the suspension is subject to sintering, the water in the aqueous suspension will evaporate and the particles of aluminum oxide will become covered with MgO as the precursor decomposes (thus forming the MgO) which will thus

be well located to getter contaminants which are adsorbed onto the particulate aluminum oxide.

Yet another inhibition to combination resides in that Kaduk et al. pertains to an aperture-type fluorescent reprographic lamp wherein an elongate clear area or aperture 13 is scraped out through the various layers which are coated onto the interior of the tube. Attention is called to column 3, lines 46-56, wherein it is set forth that:

The phosphor 12, which may consist of zinc orthosilicate Zn₂SiO₄, is next applied as a suspension in a solution of nitrocellulose in butyl acetate which is drawn up into the bulb and allowed to drain out. At this stage, the clear area of aperture 13 is scraped out in the desired width. The scraping removes the relatively thick powdery reflective layer 10 of TiO₂, the undercoat 11, and the phosphor layer 12, but the clear protective layer 9 of TiO2 which resulted from the hydrolysis of tetrabutyl titanate is very adherent and is not affected. Examples of other phosphors that have been found suitable are MgAl gallate, or cool white halophosphate; many other phosphors can be used. The bulb is then lehred at a temperature of about 550° to 600°C for 3 to 5 minutes to decompose and drive out the binder of the phosphor 12 and its undercoat 11. Instead of applying the coatings over the entire periphery and then scraping, an alternative method is to introduce a pool of suspension of the desired coating in a horizontally supported tube which is then rocked back and fourth to achieve the desired angular width of reflective coating, followed by drying and lehring, as taught in U.S. Pat. No. 2,892,440-Fulton et al. (Emphasis added)

It will thus be appreciated that it would be also necessary to consider forming an aperture of the nature used in Kaduk et al. in the Trushell arrangement and the reasons that the aperture is provided, if the teachings of Kaduk et al. were to be accurately transferred to those of Trushell. Applicant is, as noted *supra*, aware that *In re Keller*

(642 F.2d 413, 208 USPQ 871 (CCPA 1981)) states that "the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference, nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the <u>combined</u> teachings of the references would have suggested to those of ordinary skill in the art."

However, Kaduk et al. is directed to a lamps such as those used in copying machines wherein light is <u>reflected outwardly through the aperture</u>, and wherein the reflective coating is used for reflecting light <u>internally</u> of the bulb and also directing this (reflected) light out through the aperture. This aperture is, therefore, fundamentally important in the Kaduk et al. arrangement and clearly influences the placement and content of the layers which are formed in the bulb of Kaduk et al.

Therefore, inasmuch as Trushell is not directed to an aperture-type fluorescent reprographic type lamp, it is submitted that the hypothetical person of ordinary skill would not be motivated, at least for this reason, to consider Kaduk et al. as containing teachings which may be applicable to those found in Trushell and which would be strong enough to induce a violation of the intent of Trushell as to the make up of the undercoat 16 used therein.

Accordingly, it is respectfully submitted that the references cited in this rejection fail to provide the hypothetical person of ordinary skill with teachings sufficient to enable a *prima facie* case of obviousness to be established. The Examiner has used Applicant's specification as a blue print to select elements from the reference.

Claim 1

Claim 1 is patentable over the combination of Trushell and Kaduk et al. in that it calls for:

An electric lamp, consisting essentially of:

- a) a lamp envelope having an inner surface;
- b) means within the lamp envelope for generating ultraviolet radiation;
- c) a **layer of a luminescent material** adjacent the inner surface of the lamp envelope for generating visible light when impinged by said ultraviolet radiation; and

disposed between said inner surface of said lamp envelope and said layer of luminescent material, for reflecting ultraviolet radiation which has passed through said layer of luminescent material back into said luminescent material for increasing the visible light output of said luminescent material, said reflective layer consisting essentially of a mixture of particulate non-fluorescent oxidic material and a getter material comprising a thermally decomposed getter precursor which reacts with contaminants present in the lamp, said getter material being formed upon thermal decomposition of the getter precursor material during lehring (sintering). (Emphasis added)

For at least the reasons advanced above, the hypothetical person of ordinary skill would not be inclined to modify Trushell with the teachings of Kaduk et al., without clear reasons to do so. The basic premise of the rejection is that Kaduk et al. <u>allegedly</u> discloses the use of MgO as gettering agent and for this reason, <u>and this reason alone</u>, it would be obvious to use MgO in the arrangement disclosed in Trushell.

Kaduk et al. suggest a layer formed predominantly of MgO with a small amount of Al₂O₃. Trushell requires a layer which is predominantly Al₂O₃. Kaduk et al. would have to be taken as suggesting that, if MgO is going to be used, a high concentration of it should be used. Trushell on the other hand, clearly suggests that the undercoat layer should be predominantly Al₂O₃ in order to achieve the <u>surprisingly</u> high lumen output. Note is made to the fact that <u>a high lumen output</u> is a very desirable characteristic for a light to have and that the hypothetical person of ordinary skill would fully appreciate the ability of the Trushell arrangement to advantageously produce a lot of light.

Further, Kaduk et al. is such as to disclose that MgO "*may*" (viz., it also may not) have a gettering function. There is no clear and definite teaching in Kaduk et al. which would suggest that adding MgO will (definitely) produce a gettering action. There is nothing else provided in the rejection to substantiate the position taken with respect to the function of MgO. Indeed, the rejection of this claim is silent as to the amount of MgO

that would be purportedly rendered obvious.

In view of this, it is submitted that the hypothetical person of ordinary skill would stand perplexed and not be inclined to risk loosing the surprisingly good result provided by the use of a predominantly Al₂O₃ layer and therefore, it is submitted, not be willing to effectively dilute this layer with MgO as would have to be seen by the hypothetical person of ordinary skill, to be suggested by Kaduk et al.

Claims 2 and 13

Claims 2 and 13, are patentable over the art of record in that they call for the claimed reflective layer to comprise a particulate aluminum oxide and a getter of an oxide of zinc or an alkaline earth metal or mixtures thereof formed by exposing the particulate aluminum oxide and an effective amount of a precursor of the zinc or alkaline earth metal oxide to the sintering. While Kaduk et al. discloses at column 3, lines 10-14, that the MgO is prepared by decomposing MgCO₃, it is disclosed as being prepared in <u>isolation</u>. This disclosure therefore does not suggest exposing the particulate aluminum oxide <u>and</u> an effective amount of a <u>precursor of the zinc or alkaline earth metal oxide</u>, to sintering.

Note is had to the position taken in the rejection that the method of forming the mixture is not germane to the patententability. However, it is submitted that the disclosure of Kaduk et al. would deter from the sintering of a precursor in the presence of particulate aluminum oxide and would not suggest the formation of MgO *in situ*. Indeed, as noted above, Kaduk et al. suggest heating MgCO₃ to form MgO which is then further mixed with other ingredients.

Claims 3 and 14

Claim 3 is patentable over the art of record in that it calls for the reflective layer to be sintered just prior to the envelope being sealed during manufacture of said lamp. The rejection is such as to indicate that Kaduk et al. also discloses that the undercoat is sintered prior to the envelope being sealed. In other words, the step of sintering is subject to rejection and no position is taken with respect to this step not being germane to patentability. Therefore, the rejection acquiesces to this step of sealing being germane to the claimed subject matter. This therefore introduces the question as why some steps are treated as limitations and others, e.g. the formation of MgO *in situ* is not.

This dichotomy is seen as reducing the tenability of the rejection of claim 2 in addition to claims 3 and 14.

Claims 4, 8 and 16

Claims 4, 8 and 16 are patentable over the art of record in that they call for the getter material to include an oxide of zinc or an alkaline earth metal-selected from the group consisting of magnesium, calcium, strontium, barium, and mixtures thereof. While Kaduk et al. discloses MgO, there is no disclosure or suggestion of the other recited elements or a mixture of the different oxides.

While it is noted that one of the list has been identified, the reason for rejecting this claim is bootstrapped using the rejection of claim 1. This rejection therefore fails for the same reason that the rejection of claim 1 fails. That is to say, the art would not be combined because of the damaging effect that must be expected upon converting a predominately aluminum oxide layer having a gamma aluminum crystalline structure (Trushell) to a layer containing a large amount of MgO – noting that to be effective for the purposes purported in Kaduk et al., the hypothetical person of ordinary skill would be forced to assume that layer of Kaduk et al. must be predominately MgO in light of the absence of any disclosure in either reference applied, that just a few percent of MgO would be effective if mixed with a large amount of Al₂O₃.

Claims 5, 9 and 15

In connection with the rejection of claims 5, 9 and 16, the final office action indicates that Kaduk et al. recites sintered mixtures comprising a thermal decomposition of a mixture of a soluble oxide precursor of an alkaline earth in an <u>aqueous</u> suspension of aluminum oxide.

A careful reading of the cited section of Kaduk et al. indicates that this is incorrect. As noted above, the MgCO₃ is individually decomposed by heating in air. There is no indication whatsoever that the MgCO₃ is in solution – which is not surprising since this would merely add to the heating required to remove the water prior initiation of the actual decomposition of the carbonate. The MgO which results from this heating, is then mixed with a ethyl cellulose binder which is formed by blending ethyl cellulose powder, di-butyl-phthalate, xylene and butanol. Al₂O₃, Sb₂O₂ and some fatty acid dispersant are then mixed in with some extra xylene/butanol (95/5%) and milled for 5

hours.

There is, therefore, <u>no water and no aqueous suspension</u>. The rejection of claims 5 and 9 is therefore untenable.

Further, as noted above, claimed invention is based on the discovery of the problem whereint the large surface area of the particulate base-coat combined with the propensity of aluminum oxide to adsorb gaseous molecules results in larger than normal amounts of contaminants being introduced into the lamp interior during manufacture.

In re Nomiya (CCPA) 509 F.2d 566; 1975 CCPA LEXIS 185; 184 USPQ (BNA) 607 established that, if a person of ordinary skill in the art, at the time of the invention, would not have expected the problem which was overcome, to have existed, then in light of this absence of any knowledge of the problem in question, it was not proper to conclude that the claimed subject matter would have been obvious to the hypothetical person of ordinary skill in the art.

That is to say, none of the cited references recognize the problem wherein the particulate Al₂O₃ is the culprit which adsorbs the unwanted gaseous molecules. Therefore, there is nothing to suggest the structure which results from sintering an **aqueous suspension** of aluminum oxide and a soluble precursor of a zinc or an alkaline earthy metal oxide. More specifically, due to the inevitable dispersion of the soluble precursor in the **aqueous suspension**, when the suspension is subject to sintering, the water in the suspension will evaporate and the particles of aluminum oxide will become covered with a coating of MgO as the precursor decomposes (thus forming the MgO) which will thus be well located to getter contaminants which are adsorbed onto the particulate aluminum oxide.

The rejection of claims 5, 9 and 15, is also untenable for at least that the problem which is solved by the subject matter of these claims has not been recognized.

Claim 6

Claim 6 calls for the getter material to be magnesium oxide (MgO). Claim differentiation causes claim 4 from which claim 6 depends to define something in addition to MgO. This claim therefore broadens the scope of claim 4 and defines a

getter material not rejected.

Claims 7, 10 and 11

While these claims define structure which is also found in Trushell, these claims are patentable in that the depend from a claim which is deemed to be patentable over the art for at least the reasons advanced above.

Claim 12

Independent claim 12 is patentable over the art applied in that it calls for a single, light transmissive and ultraviolet radiation reflecting layer disposed on said inner surface of the lamp envelope and for the single layer to consist essentially of a sintered mixture of an aluminum oxide material and a getter material which reacts with contaminants present in the lamp. It is submitted that the art would not lead to this arrangement in that a proper transfer of teachings from Kaduk et al. to Trushell would not occur for at least the reasons advanced above.

Claims 21 and 22

These claims are patentable over the art applied in that they call for the reflective layer to be continuous and aperture free. As noted above *In re Keller* does not allow the hypothetical person of ordinary skill to just ignore teachings of a references simply because there is no requirement that features of a secondary reference be bodily incorporated into the structure of the primary reference. The fact that Kaduk et al. is provided with an aperture is because it is the aperture through which the light is intended to be transmitted. See Kaduk et al. column 1, lines 12-19). This is not a minor feature which can be glossed over. Further, reflective layers are arranged in accordance with the intention of directing the light out through the aperture. This would, therefore, be taken into consideration by the hypothetical person of ordinary skill.

Claims 23 and 24

Claims 23 and 24 are patentable over the art of record in that the reflective layers are required to be formed directly on the inner surface of the lamp envelope. It is submitted that this cannot be derived from a combination of the teachings of Trushell and Kaduk et al. Kaduk et al. discloses the MgO + Al₂O₃ layer as being disposed inside of reflective layer of TiO₂ and a protective coating which is disposed directly on the glass

wall of the envelope. Most certainly, if the use of a MgO + Al_2O_3 layer is contemplated in view of the teachings of Kaduk et al., then the positioning of such a layer would at least considered by the hypothetical person of ordinary skill. Indeed, this hypothetical person has no choice but to consider the disclosure of each reference as a whole and therefore would be provided with the inclination to provide the MgO + Al_2O_3 layer in the position disclosed in Kaduk et al. and not to blithely ignore these teachings as would appear to be key to the rejections advanced in this final office action.

Conclusion

Appellants respectfully submit that the rejections fails to establish *prima facie* cases of anticipation and/or obviousness. It is therefore respectfully requested that the rejection be reversed.

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Claims Appendix

- 1. An electric lamp, consisting essentially of:
 - a) a lamp envelope having an inner surface;
 - b) means within the lamp envelope for generating ultraviolet radiation;
- c) a layer of a luminescent material adjacent the inner surface of the lamp envelope for generating visible light when impinged by said ultraviolet radiation; and
- d) a reflective layer, said reflective layer being disposed between said inner surface of said lamp envelope and said layer of luminescent material, for reflecting ultraviolet radiation which has passed through said layer of luminescent material back into said luminescent material for increasing the visible light output of said luminescent material, said reflective layer consisting essentially of a mixture of particulate non-fluorescent oxidic material and a getter material comprising a thermally decomposed getter precursor which reacts with contaminants present in the lamp, said getter material being formed upon thermal decomposition of the getter precursor material during lehring (sintering).
- 2. A lamp according to claim 1, wherein the reflective layer comprises a particulate aluminum oxide and a getter of an oxide of zinc or an alkaline earth metal or mixtures thereof formed by exposing the particulate aluminum oxide and an effective amount of a precursor of the zinc or alkaline earth metal oxide to the sintering.
- 3. A lamp as claimed in claim 2, wherein said reflective layer is sintered just prior to the envelope being sealed during manufacture of said lamp.
- 4. A lamp as claimed in claim 2, wherein said getter material includes an oxide of zinc or an alkaline earth metal-selected from the group consisting of magnesium, calcium, strontium, barium, and mixtures thereof.
- 5. A lamp as claimed in claim 4, wherein said sintered mixture comprises a thermal decomposition of a soluble precursor compound of the zinc or the alkaline earth metal oxide or mixtures thereof in an aqueous suspension of aluminum oxide.
- 6. A lamp as claimed in claim 4, wherein said getter material is magnesium oxide.

- 7. A lamp as claimed in claim 2, wherein said layer of luminescent material comprises a halophosphate phosphor.
- 8. A lamp as claimed in claim 7, wherein said getter material includes an oxide of zinc or an alkaline earth metal selected from the group consisting of magnesium, calcium, strontium, barium and mixtures thereof.
- 9. A lamp as claimed in claim 8, wherein said sintered mixture is derived from a soluble precursor material of zinc oxide or an alkaline earth metal and mixtures thereof in an aqueous suspension of aluminum oxide.
- 10. A lamp according to claim 1, wherein said means for generating ultraviolet radiation comprises a filling of an ionizable material a rare gas and a pair of discharge electrodes between which a discharge takes place during lamp operation.
- 11. A lamp according to claim 10, wherein the pair of discharge electrodes are each adjacent a respective sealed end of said discharge vessel.
- 12. A low pressure mercury vapor fluorescent lamp, comprising:
- a) a tubular, light transmissive lamp envelope having opposing sealed ends and an inner tubular surface;
 - b) a filling of mercury and a rare gas;
- c) a pair of discharge electrodes each arranged at a respective sealed end of said lamp envelope;
- c) means for connecting said discharge electrodes to a source of electric potential outside of said lamp envelope, whereby during lamp operation a gas discharge is maintained between said discharge electrodes, which gas discharge emits ultraviolet radiation;
- d) a single reflecting layer disposed on said inner surface of said lamp envelope, said single reflecting layer consisting essentially of a sintered mixture of an aluminum oxide material and a getter material which reacts with contaminants present in the lamp; and
 - e) a layer of luminescent material disposed on the single reflecting layer.

- 13. A lamp as claimed in claim 12, wherein said reflecting layer comprises particulate aluminum and an oxide of zinc or an alkaline earth metal or mixtures thereof formed by lehring (sintering).
- 14. A lamp as claimed in claim 12, wherein said reflecting layer is sintered just prior to the envelope being sealed during manufacture of said lamp.
- 15. A lamp as claimed in claim 14, wherein said getter material includes an oxide of zinc or an alkaline earth metal selected from the group consisting of magnesium, calcium, strontium, barium and mixtures thereof.
- 16. A lamp as claimed in claim 15, wherein said sintered mixture comprises a thermal decomposition of a mixture of a soluble oxide precursor material of zinc oxide or an alkaline earth metal or mixture thereof in an aqueous suspension of aluminum oxide.
- 21. A lamp according to claim 1, wherein the reflective layer on the inner surface of the lamp envelope, is continuous and aperture free.
- 22. A lamp according to claim 12, wherein the single light reflective layer and the layer of luminescent material which are formed on the inner surface of the lamp envelope are both continuous and aperture free.
- 23. A lamp according to claim 1, wherein the reflective layer is disposed directly on the inner surface of the lamp envelope.
- 24. A lamp according to claim 12, wherein the single light reflective layer is disposed directly on the inner surface of the lamp envelope and wherein the layer of luminescent material is disposed directly on the single light reflective layer.

Evidence Appendix

- A) References of record
- 1) United States Patent No. 5,552,665 to Trushell
- 2) United States Patent No. 3,875,455 to Kaduk et al.
- 3) United States Patent No. 3,569,762 to Levine
- 4) United States Patent No. 5,898,265 to Woodward et al.
- 5) United States Patent No 5130,602 to Verwimp
- B) Citations
- 1) In re Rouffet, 149 F.3d 1350, 1357, 47 USPQ2d 1453, 1457-58 (Fed. Cir. 1998)
- 2) Al-Site Corp. v. VSI Int'l Inc., 174 F.3d 1308, 50 USPQ2d 1161 (Fed. Cir. 1999)
- 3) In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984)."
- 4) In re Ratti, 270 F.2d 810, 123 USPQ 349 (CCPA 1959)."
- 5) In re Keller (642 F.2d 413, 208 USPQ 871 (CCPA 1981)
- 6) In re Nomiya (CCPA) 509 F.2d 566; 1975 CCPA LEXIS 185; 184 USPQ (BNA) 60



149 F.3d 1350 149 F.3d 1350, 47 U.S.P.Q.2d 1453 (Cite as: 149 F.3d 1350)

C Briefs and Other Related Documents

United States Court of Appeals, Federal Circuit.

In re Denis ROUFFET, Yannick Tanguy and Frederic Berthault.

No. 97-1492.

July 15, 1998.

Applicants sought patent for invention claiming satellite technology to reduce number of necessary "handovers" between beams transmitted by single satellite. The Board of Patent Appeals and Interferences rejected application as obvious, and applicants appealed. The Court of Appeals, Rader, Circuit Judge, held that neither combination of two prior art patents and conference report nor combination of two other prior art patents rendered invention obvious, absent motivation to combine those references.

Reversed.

West Headnotes

[1] Patents @===112.3(2)

291k112.3(2) Most Cited Cases

To reject claims in patent application as obvious, an examiner must show unrebutted prima facie case of obviousness; in absence of proper prima facie case, applicant who complies with the other statutory requirements is entitled to a patent. 35 U.S.C.A. § 103.

[2] Patents \$\infty\$ 113(6)

291k113(6) Most Cited Cases

On appeal to Board of Patent Appeals and Interferences, patent applicant can overcome a rejection on grounds of obviousness by showing insufficient evidence of prima facie obviousness or by rebutting prima facie case with evidence of secondary indicia of nonobviousness. 35 U.S.C.A. § 103.

[3] Patents \$\infty\$ 113(6)

291k113(6) Most Cited Cases

While Court of Appeals reviews determination of obviousness by Board of Patent Appeals and

Interferences in light of entire record, patent applicant may specifically challenge an obviousness rejection by showing that Board reached an incorrect conclusion of obviousness or that Board based its obviousness determination on incorrect factual predicates.

. [4] Patents 🗪 113(6)

291k113(6) Most Cited Cases

Court of Appeals reviews ultimate determination of obviousness by Board of Patent Appeals and Interferences as a question of law.

[5] Patents \$\infty\$ 16(2)

291k16(2) Most Cited Cases

15] Patents \$\infty\$16.5(1)

291k16.5(1) Most Cited Cases

The factual predicates underlying an obviousness determination include the scope and content of the prior art, the differences between the prior art and the claimed invention, and the level of ordinary skill in the art. 35 U.S.C.A. § 103.

[6] Patents \$\infty\$ 113(6)

291k113(6) Most Cited Cases

Court of Appeals reviews factual findings of Board of Patent Appeals and Interferences for clear error, and finding is clearly erroneous when, although there is evidence to support it, the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed.

[7] Patents 36.1(2)

291k36.1(2) Most Cited Cases

[7] Patents \$\infty\$ 36.1(3)

291k36.1(3) Most Cited Cases

[7] Patents \$\infty\$ 36.1(4)

291k36.1(4) Most Cited Cases

[7] Patents \$\infty\$ 36.2(1)

291k36.2(1) Most Cited Cases

Objective evidence of invention's nonobviousness includes copying, long felt but unsolved need, failure of others, commercial success, unexpected results created by the claimed invention, unexpected properties of the claimed invention, licenses showing industry respect for the invention, and skepticism of skilled artisans before the invention. 35 U.S.C.A. § 103.

[8] Patents \$\infty\$97

291k97 Most Cited Cases

Board of Patent Appeals and Interferences must consider all of patent applicant's evidence in determining whether claimed invention is obvious. 35 U.S.C.A. § 103.

149 F.3d 1350, 47 U.S.P.Q.2d 1453

(Cite as: 149 F.3d 1350)

[9] Patents \$\infty\$ 314(5)

291k314(5) Most Cited Cases

Whether the evidence presented suffices to rebut the prima facie case of obviousness is part of the ultimate conclusion of obviousness and is therefore a question of law. 35 U.S.C.A. § 103.

[10] Patents 6 16.5(1)

291k16.5(1) Most Cited Cases

When rejection of patent application for obviousness depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. 35 U.S.C.A. § 103.

[11] Patents @ 26(1)

291k26(1) Most Cited Cases

When determining the patentability of a claimed invention which combines two known elements, the question in determining issue of obviousness is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination. 35 U.S.C.A. § 103.

[12] Patents \$\infty\$ 26(1)

291k26(1) Most Cited Cases

Combination of two prior art patents and conference report did not render obvious invention claiming satellite technology to reduce number of necessary "handovers" between beams transmitted by single satellite, even if combination of references contained all elements claimed in patent application, absent any evidence of motivation to combine such references other than high level of skill in the relevant art. 35 U.S.C.A. § 103.

[13] Patents \$\infty\$ 16(3)

291k16(3) Most Cited Cases

Obviousness is determined from vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains, which is construct akin to "reasonable person" used as reference in negligence determinations and presumes that all prior art references in the field of the invention are available to hypothetical skilled artisan. 35 U.S.C.A. § 103(a).

[14] Patents 26(1)

291k26(1) Most Cited Cases

Combination of prior art patents relating to cellular communications systems did not render obvious invention claiming satellite technology to reduce number of necessary "handovers" between beams transmitted by single satellite, absent identification of specific principle providing motivation to combine those prior art references. 35 U.S.C.A. § 103.

Patents @== 328(2)

291k328(2) Most Cited Cases

4.872,015, 5,170,485, 5,199,672, 5,394,561. Cited as prior art.

*1352 Richard C. Turner and Grant K. Rowan, Sughrue, Mion, Zinn, Macpeak & Seas, PLLC, Washington, DC, argued for appellants.

<u>David J. Ball, Jr.</u>, Associate Solicitor, Office of the Solicitor, Patent and Trademark Office, Arlington, Virginia, argued for appellee. With him on the brief were <u>Nancy J. Linck</u>, Solicitor, Albin F. Drost, Deputy Solicitor, and <u>Craig R. Kaufman</u>, Associate Solicitor. Of counsel was <u>Scott A. Chambers</u>, Associate Solicitor, Office of the Solicitor.

Before <u>PLAGER</u>, Circuit Judge, <u>ARCHER</u>, Senior Circuit Judge, and <u>RADER</u>, Circuit Judge.

RADER, Circuit Judge.

Denis Rouffet, Yannick Tanguy, and Frédéric Bethault (collectively, Rouffet) submitted application 07/888,791 (the application) on May 27, 1992. The Board of Patent Appeals and Interferences (the Board) affirmed final rejection of the application as obvious under 35 U.S.C. § 103(a). See Ex parte Rouffet, No. 96-1553 (Bd. Pat.App. & Int. Apr. 16, 1997). Because the Board reversibly erred in identifying a motivation to combine the references, this court reverses.

I.

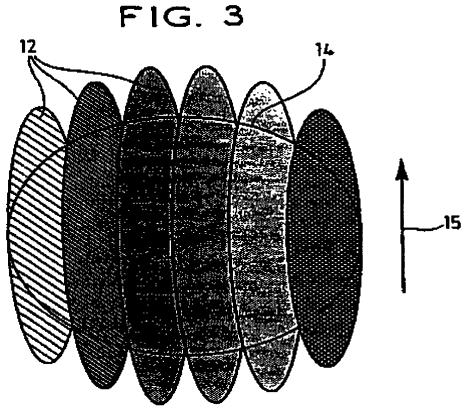
Satellites in a geosynchronous or geostationary orbit remain over the same point on the Earth's surface. Their constant position above the Earth's surface facilitates communications. These satellites project a number of beams to the Earth. Each beam transmits to its area of coverage, or footprint, on the In order to provide complete Earth's surface. coverage, adjacent footprints overlap slightly and therefore must use different frequencies to avoid interference. However, two or more nonoverlapping footprints can use the same set of frequencies in order to use efficiently the limited radio spectrum. Figure 1 from the application shows the coverage of a portion of the Earth's surface provided by multiple cone shaped beams:

*1353 FIG. 1

FIG. 1

Frequency reuse techniques, however, have a limited ability to compensate for congestion in geostationary orbits. To alleviate the orbit congestion problem, new telecommunications systems use a network of satellites in low Earth orbit. When viewed from a fixed point on the Earth's surface, such satellites do not remain stationary but move overhead. satellite's motion as it transmits a plurality of coneshaped beams creates a new problem. The satellite's movement causes a receiver on the Earth's surface to move from the footprint of one beam into a second beam transmitted by the same satellite. Eventually, the satellite's motion causes the receiver to move from the footprint of a beam transmitted by one satellite into the footprint of a beam transmitted by a second satellite. Each switch from one footprint to another creates a "handover" event analogous to that which occurs when a traditional cellular phone travels from one cell to another. Handovers are undesirable because they can cause interruptions in signal transmission and reception.

Rouffet's application discloses technology to reduce the number of handovers between beams transmitted by the same satellite. In particular, Rouffet eliminates handovers caused solely by the satellite's motion. To accomplish this goal, Rouffet changes the shape of the beam transmitted by the satellite's antenna. Rouffet's satellites transmit fan-shaped beams. A fan beam has an elliptical footprint. Rouffet aligns the long axis of his beams parallel to the direction of the satellite's motion across the Earth's surface. By elongating the beam's footprint in the direction of satellite travel, Rouffet's invention ensures that a fixed point on the Earth's surface likely will remain within a single footprint until it is necessary to switch to another satellite. Because Rouffet's invention does not address handovers caused by the motion of the receiver across the Earth's *1354 surface. his arrangement reduces, but does not eliminate, handovers. Figure 3 from the application shows the footprints 12 from six beams aligned in the direction of satellite motion 15:



The application contains ten claims that stand or fall as a group. Claim 1 is representative:

A low orbit satellite communications system for mobile terminals, wherein the communications antenna system of each satellite provides isoflux coverage made up of a plurality of fan beams that are elongate in the travel direction of the satellite.

The examiner initially rejected Rouffet's claims as unpatentable over <u>U.S. Pat. No. 5,199,672 (King)</u> in view of <u>U.S. Pat. No. 4,872,015 (Rosen)</u> and a conference report entitled "A Novel Non-Geostationary Satellite Communications System," *Conference Record,* International Conference on Communications, 1981 (Ruddy). On appeal to the Board, the examiner added an alternative ground for rejection, holding that the claims were obvious over <u>U.S. Pat. No. 5,394,561 (Freeburg)</u> in view of <u>U.S. Pat. No. 5,170,485 (Levine)</u>.

On April 16, 1997, the Board issued its decision. Because Rouffet had specified that the claims would stand or fall as a group based on the patentability of claim 1, the Board limited its opinion to that claim. The Board unanimously determined that the examiner had properly rejected claim 1 as obvious

over King in view of Rosen and Ruddy. The Board, on a split vote, also affirmed the rejection over Freeburg in view of Levine.

*1355 II

[1][2] To reject claims in an application under section 103, an examiner must show an unrebutted prima facie case of obviousness. See In re Deuel, 51 F.3d 1552, 1557, 34 U.S.P.Q.2d 1210, 1214 (Fed.Cir.1995). In the absence of a proper prima facie case of obviousness, an applicant who complies with the other statutory requirements is entitled to a patent. See In re Oetiker, 977 F.2d 1443, 1445, 24 U.S.P.Q.2d 1443, 1444 (Fed.Cir.1992). On appeal to the Board, an applicant can overcome a rejection by showing insufficient evidence of prima facie obviousness or by rebutting the prima facie case with evidence of secondary indicia of nonobviousness. See id.

[3][4][5][6] While this court reviews the Board's determination in light of the entire record, an applicant may specifically challenge an obviousness rejection by showing that the Board reached an incorrect conclusion of obviousness or that the Board based its obviousness determination on incorrect factual predicates. This court reviews the ultimate determination of obviousness as a question of law.

See In re Lueders, 111 F.3d 1569, 1571, 42 U.S.P.Q.2d 1481, 1482 (Fed.Cir.1997). The factual predicates underlying an obviousness determination include the scope and content of the prior art, the differences between the prior art and the claimed invention, and the level of ordinary skill in the art. See Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH, 139 F.3d 877, 881, 45 U.S.P.Q.2d 1977, 1981 (Fed.Cir.1998). This court reviews the Board's factual findings for clear error. See In re Zurko, 142 F.3d, 1447, 1449, 46 U.S.P.Q.2d 1691, 1693 (Fed.Cir.1998) (in banc); Lueders, 111 F.3d at 1571-72. "'A finding is clearly erroneous when, although there is evidence to support it, the reviewing court on the entire evidence is left with the definite and firm conviction that a mistake has been committed.' " In re Graves, 69 F.3d 1147, 1151, 36 U.S.P.Q.2d 1697, 1700 (Fed.Cir.1995) (quoting United States v. United States Gypsum Co., 333 U.S. 364, 395, 68 S.Ct. 525, 92 L.Ed. 746 (1948)).

[7][8][9] The secondary considerations are also essential components of the obviousness determination. See In re Emert, 124 F.3d 1458, 1462, 44 U.S.P.Q.2d 1149, 1153 (Fed.Cir.1997) ("Without Emert providing rebuttal evidence, this prima facie case of obviousness must stand."). This objective evidence of nonobviousness includes copying, long felt but unsolved need, failure of others, see Graham v. John Deere Co., 383 U.S. 1, 17-18, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966), commercial success, see In re Huang, 100 F.3d 135, 139-40, 40 U.S.P.Q.2d 1685. (Fed.Cir.1996), unexpected results created by the claimed invention, unexpected properties of the claimed invention, see In re Mayne, 104 F.3d 1339, 1342, 41 U.S.P.Q.2d 1451, 1454 (Fed.Cir.1997); In re Woodruff, 919 F.2d 1575, 1578, 16 U.S.P.Q.2d 1934, 1936-37 (Fed.Cir.1990), licenses showing industry respect for the invention, see Arkie Lures. Inc. v. Gene Larew Tackle, Inc., 119 F.3d 953, 957, 43 U.S.P.Q.2d 1294, 1297 (Fed.Cir.1997); Pentec, Inc. v. Graphic Controls Corp., 776 F.2d 309, 316, 227 U.S.P.Q. 766, 771 (Fed.Cir.1985), skepticism of skilled artisans before the invention, see In re Dow Chem. Co., 837 F.2d 469, 473, 5 U.S.P.Q.2d 1529, 1532 (Fed.Cir.1988). The Board must consider all of the applicant's evidence. Oetiker, 977 F.2d at 1445 ("An observation by the Board that the examiner made a prima facie case is not improper, as long as the ultimate determination of patentability is made on the entire record."); In re Piasecki, 745 F.2d 1468, 1472, 223 U.S.P.Q. 785, 788 (Fed.Cir.1984). The court reviews factual conclusions drawn from this evidence for clear error.

Whether the evidence presented suffices to rebut the *prima facie* case is part of the ultimate conclusion of obviousness and is therefore a question of law.

[10][11] When a rejection depends on a combination of prior art references, there must be some teaching, suggestion, or motivation to combine the references. See In re Geiger, 815 F.2d 686, 688, 2 U.S.P.Q.2d 1276, 1278 (Fed.Cir.1987). Although the suggestion to combine references may flow from the nature of the problem, see Pro-Mold & Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1573, 37 U.S.P.Q.2d 1626, 1630 (Fed.Cir.1996), suggestion more often comes from the teachings of the pertinent references, see In re Sernaker, 702 F.2d 989, 994, 217 U.S.P.Q. 1, 5 (Fed.Cir.1983), or from the ordinary knowledge of those skilled in the art that certain references are of special importance *1356 in a particular field, see Pro-Mold, 75 F.3d at 1573 (citing Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 297 n. 24, 227 <u>U.S.P.Q. 657, 667 n. 24 (Fed.Cir.1985)</u>). Therefore, "[w]hen determining the patentability of a claimed invention which combines two known elements, 'the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.' " See In re Beattie, 974 F.2d 1309, 1311-12, 24 U.S.P.Q.2d 1040, 1042 (Fed.Cir.1992) (quoting *Lindemann* Maschinenfabrik GMBH v. American Hoist & Derrick Co., 730 F.2d 1452, 1462, 221 U.S.P.Q. 481, 488 (Fed.Cir.1984)).

Ш

The parties agree that the five references asserted by the examiner are in the same field of endeavor as the invention. The parties also agree that the pertinent level of skill in the art--design of satellite communications systems--is high. On appeal, Rouffet asserts that the examiner and the Board erred by improperly combining references to render the claimed invention obvious.

The Combination of King, Rosen, and Ruddy

[12] The Board first affirmed the rejection of Rouffet's claims over a combination of King, Rosen, and Ruddy. King discloses a system for launching a plurality of satellites into low Earth orbits from a single launch vehicle. Rosen teaches a geostationary satellite that uses a plurality of fan beams with their long axes oriented in an east-west direction to communicate with mobile and fixed terminals on the Earth.

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(Cite as: 149 F.3d 1350)

The final, and most important, reference in this combination is Ruddy. Ruddy describes a television broadcast system that uses a series of satellites to retransmit signals sent from a ground station over a wide area. Rather than using a geostationary orbit, Ruddy teaches the use of a series of satellites in Molniya orbits. A satellite in a Molniya orbit always follows the same path through the sky when viewed from a fixed point on the ground. Viewed from the Earth, the orbital path includes a narrow, elliptical apogee loop. In order to transmit to these moving satellites from a ground station, Ruddy uses a fan beam with a long axis aligned with the long axis of the orbit's apogee loop. This alignment places the entire apogee loop within the footprint of the beam and eliminates the need for the ground station's antenna to track the satellite's motion around the apogee loop. Ruddy further teaches orbit parameters and spacing of multiple satellites to ensure that a satellite is always in the loop to receive and rebroadcast signals from the Earth station.

King and Rosen together teach the use of a network of satellites in low Earth orbit. Thus, Ruddy becomes the piece of the prior art mosaic that shows, in the reading of the Board, the use of "a plurality of fan beams that are elongate in the travel direction of the satellite." Ruddy, however, is different from the claimed invention in several respects. Specifically, the application claims the projection of multiple elliptical fan-shaped footprints from the satellite to the ground. See Claim 1, supra, see also Application at 6, lines 9-11 ("In addition, in this system, the geometrical shape of the beams 12 is changed: instead of being circular they are now elongate ellipses."). The application's written description further teaches that the invention's fan-shaped satellite beams will minimize handovers. See id. at lines 11-16 ("This considerably increases call durations between handovers.").

In contrast, Ruddy teaches that a ground station may use a single fan-shaped beam to transmit to a satellite in a unique Molniya orbit. The ground station transmits a beam into which a series of satellites in Molniya orbits will successively enter. At least two differences are evident: the application teaches projection of multiple beams from a satellite to the Earth, while Ruddy teaches projection of a single beam from the Earth to satellites. Moreover to the extent Ruddy contains a teaching about handovers, its teachings focus on use of the unique Molniya orbit to ensure that a satellite always falls within the beam transmitted by the ground station.

These differences suggest some difficulty in showing a prima facie case of obviousness. however, specifically found that artisans of ordinary skill in this field of art would know to shift the frame of reference from a ground station following a satellite to a satellite transmitting to the ground. According proper deference to the Board's finding *1357 of a lofty skill level for ordinary artisans in this field, this court discerns no clear error in the Board's conclusion that these differences would not preclude a finding of obviousness. While Ruddy does not expressly teach alignment of the fan beam with the apparent direction of the satellite's motion, this court perceives no clear error in the Board's determination that Ruddy would suggest such an alignment to one of skill in this art. Therefore, the Board did not err in finding that the combination of King, Rosen, and Ruddy contains all of the elements claimed in Rouffet's application.

However, the Board reversibly erred in determining that one of skill in the art would have been motivated to combine these references in a manner that rendered the claimed invention obvious. Indeed, the Board did not identify any motivation to choose these references for combination. Ruddy does not specifically address handover minimization. To the extent that Ruddy at all addresses handovers due to satellite motion, it addresses this subject through the selection of orbital parameters. Ruddy does not teach the choice of a particular shape and alignment of the beam projected by the satellite. Thus Ruddy addresses the handover problem with an orbit selection, not a beam shape. The Board provides no reasons that one of ordinary skill in this art, seeking to minimize handovers due to satellite motion, would combine Ruddy with Rosen and King in a manner that would render the claimed invention obvious.

[13] Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art to which the patent pertains. See 35 U.S.C. § 103(a). This legal construct is akin to the "reasonable person" used as a reference in negligence determinations. The legal construct also presumes that all prior art references in the field of the invention are available to this hypothetical skilled artisan. See In re Carlson, 983 F.2d 1032, 1038, 25 U.S.P.Q.2d 1207, 1211 (Fed.Cir.1993).

As this court has stated, "virtually all [inventions] are combinations of old elements." Environmental Designs, Ltd. v. Union Oil Co., 713 F.2d 693, 698, 218 U.S.P.Q. 865, 870 (Fed.Cir.1983); see also

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(Cite as: 149 F.3d 1350)

Richdel, Inc. v. Sunspool Corp., 714 F.2d 1573, 1579-80, 219 U.S.P.Q. 8, 12 (Fed.Cir.1983) ("Most, if not all, inventions are combinations and mostly of old elements."). Therefore an examiner may often find every element of a claimed invention in the prior art. If identification of each claimed element in the prior art were sufficient to negate patentability, very few patents would ever issue. Furthermore, rejecting patents solely by finding prior art corollaries for the claimed elements would permit an examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. approach would be "an illogical and inappropriate process by which to determine patentability." Sensonics, Inc. v. Aerosonic Corp., 81 F.3d 1566, 1570, 38 U.S.P.Q.2d 1551, 1554 (Fed.Cir.1996).

To prevent the use of hindsight based on the invention to defeat patentability of the invention, this court requires the examiner to show a motivation to combine the references that create the case of obviousness. In other words, the examiner must show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for combination in the manner claimed.

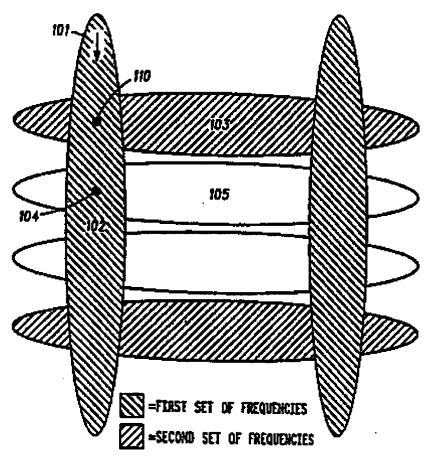
This court has identified three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art. In this case, the Board relied upon none of these. Rather, just as it relied on the high level of skill in the art to overcome the differences between the claimed invention and the selected elements in the references, it relied upon the high level of skill in the art to provide the necessary motivation. The Board did not, however, explain what specific understanding or technological principle within the knowledge of one of ordinary skill in the art would have suggested the combination. Instead, the Board merely invoked the high level of skill in the field of art. If such a rote invocation could suffice to supply a motivation to combine, the more sophisticated scientific fields

would rarely, if ever, experience a patentable technical advance. Instead, in complex scientific fields, the Board could routinely identify the prior art elements in an application, invoke the lofty level of skill, and rest its case for rejection. To counter this potential weakness in the obviousness*1358 construct, the suggestion to combine requirement stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness.

Because the Board did not explain the specific understanding or principle within the knowledge of a skilled artisan that would motivate one with no knowledge of Rouffet's invention to make the combination, this court infers that the examiner selected these references with the assistance of hindsight. This court forbids the use of hindsight in the selection of references that comprise the case of obviousness. See In re Gorman, 933 F.2d 982, 986, 18 U.S.P.Q.2d 1885, 1888 (Fed.Cir.1991). Lacking a motivation to combine references, the Board did not show a proper prima facie case of obviousness. This court reverses the rejection over the combination of King, Rosen, and Ruddy.

The Combination of Freeburg and Levine

[14] Freeburg teaches a cellular radiotelephone system based on a constellation of low Earth orbit satellites that use conical beams to transmit from the satellite to both fixed and mobile Earth stations. Levine teaches an Earth-based cellular radio system that uses fan beams broadcast from antenna towers. Levine's elliptical footprints are aligned with the road grid. To increase the capacity of traditional groundbased systems through frequency reuse techniques, Levine teaches the use of antennas that broadcast signals with smaller footprints than the prior art system. Thus, Levine actually increases the number of overlap regions between cells and, hence, the number of potential handovers. Figure 1 of the Levine patent illustrates its alignment of beam footprints:



*1359 As a mobile unit (e.g., a driver using a car phone) moves though a succession of overlapping zones, Levine uses selection algorithms to determine which of the cells is aligned with the travel direction of the mobile unit. These algorithms then select this cell for use while continually monitoring intersecting cells in the event that the mobile unit changes direction.

Once again, this court notes significant differences between the teachings of the application and the Levine-Freeburg combination. The critical Levine reference again involves a beam from an Earth station without any reference to the "travel direction of [a] satellite." Moreover, Levine actually multiplies the number of potential handovers and then uses software to sort out the necessary handovers from the unnecessary. However, the Board explains the reasons that one possessing the lofty skills characteristic of this field would know to account for the differences between the claimed invention and the prior art combination. This court discerns no clear error in that reliance on the considerable skills in this field.

FIG.1

This court does, however, discern reversible error in the Board's identification of a motivation to combine Levine and Freeburg. In determining that one of skill in the art would have had motivation to combine Levine and Freeburg, the Board noted that "[t]he level of skill in the art is very high." As noted before, this observation alone cannot supply the required suggestion to combine these references. The Board posits that the high level of skill in the art overcomes the absence of any actual suggestion that one could select part of the teachings of Levine for combination with the satellite system disclosed by Freeburg.

As noted above, the suggestion to combine requirement is a safeguard against the use of hindsight combinations to negate patentability. While the skill level is a component of the inquiry for a suggestion to combine, a lofty level of skill alone does not suffice to supply a motivation to combine. Otherwise a high level of ordinary skill in an art field would almost always preclude patentable inventions. As this court has often noted, invention itself is the process of combining prior art in a nonobvious

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(Cite as: 149 F.3d 1350)

manner. See, e.g., Richdel, 714 F.2d at 1579; Environmental Designs, 713 F.2d at 698. Therefore, even when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. Cf. Gechter v. Davidson, 116 F.3d 1454, 43 U.S.P.Q.2d 1030 (Fed.Cir.1997) (explaining that the Board's opinion must describe the basis for its decision). In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious.

The Board's naked invocation of skill in the art to supply a suggestion to combine the references cited in this case is therefore clearly erroneous. Absent any proper motivation to combine part of Levine's teachings with Freeburg's satellite system, the rejection of Rouffet's claim over these references was improper and is reversed.

IV

The Board reversibly erred in determining that there was a motivation to combine either the teachings of King, Rosen, and Ruddy or of Freeburg and Levine in a manner that would render the claimed invention obvious. Because this predicate was missing in each case, the Board did not properly show that these references render the claimed invention obvious. Therefore this court reverses the Board's decision upholding the rejection of Rouffet's claims. In light of this disposition, Rouffet's pending motion to remand the case to the Board for further consideration is denied as moot.

COSTS

Each party shall bear its own costs.

REVERSED.

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Briefs and Other Related Documents (Back to top)

• 1997 WL 33545154 (Appellate Brief) Brief for Appellants in re Rouffet, et al. (Oct. 14, 1997)Original Image of this Document with Appendix (PDF)

END OF DOCUMENT



174 F.3d 1308 174 F.3d 1308, 50 U.S.P.Q.2d 1161 (Cite as: 174 F.3d 1308)

Briefs and Other Related Documents

United States Court of Appeals, Federal Circuit.

AL-SITE CORPORATION and Magnivision, Inc., Plaintiffs-Appellants,

VSI INTERNATIONAL, INC. and Myron Orlinsky, Defendants-Cross Appellants.

Nos. 97-1593, 98-1008.

March 30, 1999. Rehearing and Suggestion for Rehearing En Banc Denied May 25, 1999.

Assignee of patents claiming hangers for displaying non-prescription eyeglasses brought action against competitor and competitor's chairman, alleging patent, trademark, and trade dress infringement. After granting assignee's motion for summary judgment on competitor's defense of inequitable conduct, 1997 WL 579201, and then conducting jury trial, the United States District Court for the Southern District of Florida, C. Clyde Atkins, Senior Judge, entered judgment upon jury verdict finding infringement of one patent, infringement of remaining patents under doctrine of equivalents, trademark and trade dress infringement, and unfair competition. The jury also imposed personal liability on competitor's chairman, making him jointly and severally liable for the damage award. Parties appealed. The Court of Appeals, Rader, Circuit Judge, held that: (1) one patent was literally infringed; (2) remaining patents were also infringed; (3) patents were not invalid for obviousness; (4) competitor did not infringe trade dress of assignee's display cards, color coding system, or eyeglass colors and styles; (5) competitor did not infringe assignee's "MAGNIVISION" trademark; (6) competitor did not engage in unfair competition; and (7) chairman was not personally liable for patent infringement.

Affirmed in part and reversed in part.

West Headnotes [1] Federal Courts 765

170Bk765 Most Cited Cases

Court of Appeals reviews the district court's denials of motions for judgment as a matter of law using the same standards applied by the district court and will only upset a jury verdict if the record lacks substantial evidence to support the verdict.

|2| Patents @== 237

291k237 Most Cited Cases

Patent for hanger used to display eyeglasses, which described use of rivet or button as fastening means, was literally infringed by accused hanger which used adhesive fastening means, because adhesive was equivalent to structure disclosed in patent specification, and adhesive was "in engagement" with extension that projected from bottom edge of hanger body, as required by the patent.

[3] Federal Courts 844

170Bk844 Most Cited Cases

As the finder of fact, the jury receives deference for its function of weighing witness demeanor, credibility, and meaning.

141 Patents \$\infty\$ 314(5)

291k314(5) Most Cited Cases

Court of Appeals reviews the district court's patent claim interpretation without deference.

[5] Patents \$\infty\$ 101(8)

291k101(8) Most Cited Cases

If the word "means" appears in a patent claim element in combination with a function, it is presumed to be a means-plus-function element under patent statute, although, according to its express terms, means-plus-function provision governs only claim elements that do not recite sufficient structural limitations, and presumption that means-plusfunction provision applies is overcome if the claim itself recites sufficient structure or material for performing the claimed function. 35 U.S.C.A. § <u>112</u>.

[6] Patents \$\infty\$ 101(8)

291k101(8) Most Cited Cases

Although use of the phrase "means for" or "step for" is not the only way to invoke statutory means-plusfunction provision, that terminology typically invokes the provision while other formulations generally do not; therefore, when an element of a claim does not use the term "means," treatment as a means-plus-function claim element is generally not appropriate. 35 U.S.C.A. § 112.

[7] Patents \$\oint_{101(8)}\$ 291k101(8) Most Cited Cases

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When it is apparent that an element of a patent claim invokes purely functional terms, without the additional recital of specific structure or material for performing that function, the claim element may be a means-plus-function element despite the lack of express means-plus-function language. 35 U.S.C.A. § 112.

[8] Patents 226.7

291k226.7 Most Cited Cases

Term "eyeglass hanger member" in patents for hangers used to display eyeglasses did not trigger application of statutory means-plus-function provision, as elements were not in traditional means-plus-function format, and claims themselves contained sufficient structural limitations for performing specified function of mounting a pair of eyeglasses. 35 U.S.C.A. § 112.

191 Patents \$\infty\$ 226.7

291k226.7 Most Cited Cases

Element of patent claim described as "attaching portion attachable to a portion of said frame of said pair of eyeglasses," in patent for hanger used to display eyeglasses, did not trigger application of statutory means-plus-function provision, as claim element was not in traditional means-plus-function form and supplied structural, not functional, terms. 35 U.S.C.A. § 112.

110| Patents @ 226.7

291k226.7 Most Cited Cases

Term "eyeglass contacting member" in patent for hangers used to display eyeglasses did not trigger application of statutory means-plus-function provision, as elements were not in traditional means-plus-function format, and claim recited sufficient structure for performing recited function. 35 U.S.C.A. § 112.

[11] Patents @ 237

291k237 Most Cited Cases

Jury's finding that structure of accused eyeglass hanger was equivalent to "means for securing" element of claimed eyeglass hanger under the doctrine of equivalents supported inference that jury considered accused structure to be "equivalent" of claimed hanger, for purpose of determining literal infringement under means-plus-function analysis, so any error in district court's claim construction and resulting instruction that led to finding of infringement under doctrine of equivalents, rather than finding of literal infringement, was harmless.

112 Patents 237

291k237 Most Cited Cases

An "equivalent" under patent statute's means-plusfunction provision informs the claim meaning for a literal infringement analysis, by restricting the scope of a functional claim limitation, while the "doctrine of equivalents" extends enforcement of claim terms beyond their literal reach in the event there is equivalence between the elements of the accused product or process and the claimed elements of the patented invention. 35 U.S.C.A. § 112.

[13] Patents \$\infty\$=237

291k237 Most Cited Cases

An equivalent structure or act under patent statute's means-plus-function provision cannot embrace technology developed after the issuance of the patent because the literal meaning of a claim is fixed upon its issuance; an "after arising equivalent" infringes, if at all, under the doctrine of equivalents, and an afterarising technology could infringe under the doctrine of equivalents without infringing literally as a mean-plus-function equivalent. 35 U.S.C.A. § 112.

|14| Patents 🖘 237

291k237 Most Cited Cases

Under patent statute's means-plus-function provision, an accused device must perform the identical function as recited in the claim element, while the doctrine of equivalents may be satisfied when the function performed by the accused device is only substantially the same. 35 U.S.C.A. § 112.

[15] Patents 237

291k237 Most Cited Cases

Where there is identity of function and no afterarising technology, a means-plus-function element of a patent claim that is found to be infringed only under the doctrine of equivalents due to a jury instruction failing to instruct on structural equivalents for meansplus-function purposes is also literally present in the accused device. 35 U.S.C.A. § 112.

[16] Patents \$\opin_{169}\$

291k169 Most Cited Cases

District court's construction of "opening means" element in patent for eyeglass hanger to mean the elongated slot having a notch as described and depicted in the patent, and the structural equivalents thereof, was not barred by prior Court of Appeals opinion construing separate patent assigned to same patentee; claims had different language and different meanings, Court of Appeals opinion was nonprecedential, and record did not indicate that Court had rejected construction at issue or that alleged infringer should be denied the opportunity to seek a narrower construction.

[17] Patents @ 168(2.1)

291k168(2.1) Most Cited Cases

Prosecution history related to one patent did not give rise to estoppel in connection with later patents that arose from related applications, where specific 174 F.3d 1308, 50 U.S.P.Q.2d 1161

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limitation added in claims of earlier issued patent was not present in claims of later issued patents.

[18] Patents \$\infty\$ 314(5)

291k314(5) Most Cited Cases

Although the determination of whether a patent is obvious is ultimately a legal conclusion, it rests on underlying factual determinations. 35 U.S.C.A. § 103.

[19] Patents 312(1.2)

291k312(1.2) Most Cited Cases

Issued patents have a strong presumption of validity in infringement proceedings, and, hence, an accused infringer who defends on grounds of patent invalidity bears the burden of showing patent invalidity by clear and convincing evidence. 35 U.S.C.A. § 282.

[20] Patents \$\infty\$16.5(1)

291k16.5(1) Most Cited Cases

[20] Patents \$\infty\$ 36(2)

291k36(2) Most Cited Cases

In a challenge to a patent based on obviousness, the person alleging invalidity must show prior art references which alone or combined with other references would have rendered the invention obvious to one of ordinary skill in the art at the time of invention, and, because the presumption of validity carries with it a presumption that the patent examiner did his duty and knew what claims he was allowing, the challenger's burden is especially difficult when the prior art was before the examiner during prosecution of the application. 35 U.S.C.A. § § 103, 282.

|21| Patents @ 16(2)

291k16(2) Most Cited Cases

Party seeking patent invalidity based on obviousness must show some motivation or suggestion to combine the prior art teachings, which generally arises in the references themselves, but may also be inferred from the nature of the problem or occasionally from the knowledge of those of ordinary skill in the art. 35 U.S.C.A. § 103.

1221 Patents @-16.18

291k16.18 Most Cited Cases

Patents for hangers used to display non-prescription eyeglasses were not invalid for obviousness, as there was no evidence of specific teaching or suggestion for combining prior art in such manner as to result in hanger with all elements of claimed hangers, evidence supported finding that one of ordinary skill in the art would not have known to make such combination, and secondary considerations supported finding of nonobviousness. 35 U.S.C.A. § 103.

[23] Patents \$\infty\$ 16(3)

291k16(3) Most Cited Cases

The level of skill in the art is a prism or lens through

which a judge or jury views the prior art and the claimed invention, for purpose of claim that patent is obvious; this reference point prevents these deciders from using their own insight or, worse yet, hindsight, to gauge obviousness. 35 U.S.C.A. § 103.

[24] Courts \$\infty\$ 96(7)

106k96(7) Most Cited Cases

For areas of law, such as trademark and trade dress infringement, which are not unique to jurisdiction of the Court of Appeals for the Federal Circuit, that Court applies the law of the pertinent regional circuit.

[25] Trade Regulation 704

382k704 Most Cited Cases

[25] Trade Regulation 725

382k725 Most Cited Cases

A finding of trademark and trade dress infringement is a question of fact, so a jury verdict of trademark or trade dress infringement is therefore reviewed for substantial evidence, although legal determinations of the district court receive no deference on review.

[26] Trade Regulation 43

382k43 Most Cited Cases

Trade dress protection embraces the total image of the product including such factors as the size, shape, and color of the product's packaging and appearance.

[27] Trade Regulation 43

382k43 Most Cited Cases

[27] Trade Regulation 349

382k349 Most Cited Cases

To prove trade dress infringement, the plaintiff must show: (1) the inherent distinctiveness or secondary meaning of its trade dress, (2) the essential nonfunctionality of its trade dress, and (3) the likelihood of consumer confusion as to origin, sponsorship, or approval due to similarity between its and the defendant's trade dress.

[28] Trade Regulation 43

382k43 Most Cited Cases

"Distinctive" trade dress enables consumers to distinguish a product from others and identify that product with its source.

[29] Trade Regulation 6-43

382k43 Most Cited Cases

Distinctiveness of trade dress is based on whether it is a common basic shape or design, whether it is unique or unusual in a particular field, and whether it is a mere refinement of a commonly adopted and well-known form of ornamentation for a particular class of goods viewed by the public as a dress or ornamentation for the goods.

[30] Trade Regulation 6-43

382k43 Most Cited Cases

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Trade dress can satisfy distinctiveness requirement by showing "secondary meaning," or a connection in the consumer's mind between the mark and the product's producer, whether that producer is known or unknown.

[31] Trade Regulation 43

382k43 Most Cited Cases

Plaintiff may show secondary meaning of trade dress with consumer surveys and with evidence of lengthy and uniform display of the dress or with evidence of the plaintiff's efforts, usually through advertising, to establish in the minds of the consumers a connection between the trade dress and its product; the plaintiff may also use other evidence showing consumers' association of the trade dress with the plaintiff or its product to prove secondary meaning.

[32] Trade Regulation 6-43

382k43 Most Cited Cases

A trade dress is "functional" if it is essential to the use or purpose of the article or if it affects the cost or quality of the article, such that its protection would place a competitor at a significant disadvantage.

[33] Trade Regulation 349

382k349 Most Cited Cases

Determining whether a likelihood of confusion exists as result of alleged trade dress infringement requires weighing several factors: (1) the nature of the plaintiff's mark, (2) the similarity of the marks, (3) the similarity of the products the marks represent, (4) the similarity of the parties' retail outlets and customers, (5) the similarity of the parties' advertising, (6) the defendant's intent to copy or imitate the plaintiff's mark, and (7) the extent of actual confusion.

[34] Trade Regulation 6-43

382k43 Most Cited Cases

Trade dress of plaintiff's display card and blister pack used to market hand-held magnifiers was not entitled to protection absent evidence of distinctiveness or secondary meaning or evidence to show likelihood of consumer confusion, regardless of whether plaintiff was sole user of its design.

[35] Trade Regulation 478

382k478 Most Cited Cases

Sole use of a design is a preliminary step for a descriptive trade dress to acquire distinctiveness and secondary meaning.

[36] Trade Regulation 43

382k43 Most Cited Cases

Color coding system used by maker of display hangers for nonprescription eyeglasses, by which eyeglasses of particular power would feature same color of stripe on hanger tag, was not entitled to trade dress protection, as there was no evidence of distinctiveness or secondary meaning, and system was primarily functional.

[37] Trade Regulation \$\infty\$ 43

382k43 Most Cited Cases

Color itself is not inherently distinctive, for purpose of trade dress protection.

[38] Trade Regulation 43

382k43 Most Cited Cases

Absent a specifically defined, color-definite, and stable visual appearance, an alleged trade dress cannot receive protection.

[39] Trade Regulation 43

382k43 Most Cited Cases

Colors and styles of six of manufacturer's eyeglasses were not entitled to trade dress protection, as there was no evidence that colors and styles were inherently distinctive or possessed secondary meaning, in view of their public availability, and manufacturer changed its styles to suit demand.

[40] Trade Regulation 334.1

382k334.1 Most Cited Cases

To prove trademark infringement, a trademark owner must show a likelihood that consumers would confuse the defendant's mark with the protected mark.

[41] Trade Regulation 334.1

382k334.1 Most Cited Cases

Factors which contribute to a likelihood of confusion finding, in a trademark infringement action, include (1) the nature of the plaintiff's mark, (2) the similarity of the marks, (3) the similarity of the products represented by the marks, (4) the similarity of the retail outlets and consumers, (5) the nature and extent of the parties' advertising, (6) the defendant's intent to copy the plaintiff's mark, and (7) the extent of actual confusion; other relevant factors include the strength of the marks, the number and nature of similar marks in use on similar goods, the nature and extent of any actual confusion and the length of time during and conditions under which there has been concurrent use without evidence of actual confusion.

[42] Trade Regulation 356

382k356 Most Cited Cases

Competitor's use of mark "MAGNA•DOT" did not infringe assignee's "MAGNIVISION" trademark for nonprescription eyeglasses, as marks did not present a similar sound, meaning, or commercial impression, there was evidence that MAGNA/MAGNI prefix and VISION suffix enjoyed wide use in the eyeglass industry on similar goods and services, and there was no evidence of actual confusion despite several years of simultaneous use in an identical market.

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[43] Trade Regulation 584.1

382k584.1 Most Cited Cases

Finding of unfair competition lacked substantial evidence, where only evidence of unfair competition came from claims of trademark and trade dress infringement, and, as matter of law, there was no trademark or trade dress infringement.

[44] Trade Regulation \$\infty\$461

382k461 Most Cited Cases

Unfair competition provides an additional degree of protection above that provided by trademark and trade dress law; although trademark and trade dress infringement may be the basis for a claim of unfair competition, it frequently requires the court to examine additional conduct that would not give rise to a claim of trademark infringement.

[45] Corporations \$\infty\$1.6(1)

101k1.6(1) Most Cited Cases

[45] Corporations 1.7(2)

101k1.7(2) Most Cited Cases

Personal liability of officer for corporation's acts of patent infringement requires sufficient evidence to justify piercing the corporate veil; the corporate entity deserves respect and legal recognition unless specific, unusual circumstances justify disregarding the corporate structure. 35 U.S.C.A. § 271(a).

[46] Corporations • 1.6(1)

101k1.6(1) Most Cited Cases

Corporate officer's act of making sole decision to continue using accused hanger tags after corporation received cease and desist letters from patent assignee was not sufficient to impose personal liability on officer for patent infringement; officer acted within and according to strictures of corporate structure, record showed no instance of the corporation operating as officer's alter ego, and officer acted upon advice of counsel. 35 U.S.C.A. § 271(a).

Patents @ 328(2)

291k328(2) Most Cited Cases

3,116,529, 3,291,300, 3,710,996, 3,738,034. Cited as prior art.

Patents @ 328(2)

291k328(2) Most Cited Cases

4,976,532, 5,144,345, 5,260,726, 5,521,911. Valid and infringed.

Patents \$\infty 328(2)

291k328(2) Most Cited Cases

5,141,104. Cited.

Trade Regulation 736

382k736 Most Cited Cases

MAGNIVISION.

*1313 Peter T. Cobrin, Cobrin, Gittes & Samuel, of New York City, argued for plaintiffs-appellants. With him on the brief was *1314_Stephen E. Nagin, Nagin, Gallop & Figueredo, P.A., of Miami, Florida, of counsel was Oren J. Warshavsky.

<u>Donald W. Rupert</u>, Mayer, Brown & Platt, of Chicago, Illinois, argued for defendants-cross appellants. With him on the brief were <u>Robert S. Rigg</u> and <u>Lisa A. Schneider</u>, of counsel on the brief were <u>Richard L. Horn</u> and <u>Heather A. Libbey</u>, Wilson & McIlvaine, of Chicago, Illinois, of counsel was <u>Myles G. Cypen</u>, Cypen & Cypen, of Miami, Florida.

Before: <u>MAYER</u>, Chief Judge, <u>RICH</u>, and <u>RADER</u>, Circuit Judges.

RADER, Circuit Judge.

This case involves patent, trademark, and trade dress infringement. After the United States District Court for the Southern District of Florida interpreted the claims, a jury found that VSI International, Inc. (VSI) had infringed several patents claiming specific hangers for displaying non-prescription eyeglasses. The jury also found trademark and trade dress infringement, and unfair competition. In addition, the jury found VSI's chairman and CEO, Myron Orlinsky, personally liable for these violations. Although Al-Site Corporation, now Magnivision, Inc. (Magnivision) [FN1], prevailed on infringement, it appeals the district court's claim construction. On review, this court discerns errors in claim construction. Under a correct claim construction, the record contains substantial evidence that VSI infringed Magnivision's patents. Therefore, this court affirms the patent infringement finding. The record, however, does not contain substantial evidence to support the jury's findings of trademark and trade dress infringement, unfair competition, or personal liability for Myron Orlinsky. Therefore, this court reverses those judgments.

FN1. After this litigation began, American Greetings Corporation acquired Al-Site Corporation, the named plaintiff in this case, and merged it with Magni-Tech Corporation to form Magnivision, Inc. The parties and this court, therefore, refer to the plaintiff as Magnivision.

I.

Magnivision and VSI both sell non-prescription eyeglasses. Magnivision is the assignee of <u>U.S. Patent Nos. 4,976,532 (the '532 patent)</u>, 5,144,345 (the '345 patent), 5,260,726 (the '726 patent), and 5,521,911 (the '911 patent). These patents claim

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(Cite as: 174 F.3d 1308)

technology for displaying eyeglasses on racks. The claimed inventions allow consumers to try on eyeglasses and return them to the rack without removing them from their display hangers.

Magnivision sued VSI, as well as its chairman and CEO, Myron Orlinsky, in his individual capacity, for infringement of the Magnivision patents, for infringement of Magnivision's MAGNIVISION trademark and the trade dress of various products, and for unfair competition under Florida law. Six years after filing, the district court conducted a jury trial. After interpreting the claims, the district court instructed the jury to apply its construction of the claims to determine infringement.

The jury determined that one of VSI's products (the Version 1 hanger tag) literally infringed the '532 patent. The jury also determined that a second VSI product (the Version 2 hanger tag) did not literally infringe the '345, '726, and '911 patents, but did infringe those patents under the doctrine of equivalents. The jury further concluded that the Magnivision patents were not invalid under 35 U.S.C. § 103. Additionally, the jury found that VSI had infringed Magnivision's trademark and trade dress and had engaged in unfair competition. Finally, the jury imposed personal liability on Myron Orlinsky, making him jointly and severally liable for the damage award.

Following the jury verdict, Magnivision moved for judgment as a matter of law that the Version 2 hanger tag literally infringed the '345, '726, and '911 patents. VSI's post-trial motion sought to reverse all of the jury's determinations. The district *1315 court denied both motions and both parties appeal. Specifically, Magnivision challenges the district court's claim construction of the '345, '726, and '911 patents, arguing that the claims, if properly construed, would have been literally infringed by VSI's Version 2 hanger tag. VSI, on the other hand, contends that the district court's claim construction was correct but challenges the jury's determinations for lack of substantial evidence to support a verdict.

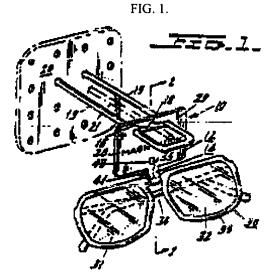
II.

[1] This court reviews the district court's denials of the motions for judgment as a matter of law using the same standards applied by the district court. See Markman v. Westview Instruments, Inc., 52 F.3d 967, 975, 34 USPQ2d 1321, 1326 (Fed.Cir.1995), aff'd, 517 U.S. 370, 116 S.Ct. 1384, 134 L.Ed.2d 577, 38 USPQ2d 1461 (1996). This court will only upset a

jury verdict if the record lacks substantial evidence to support the verdict. See <u>Motorola, Inc. v. Interdigital Tech. Corp.</u>, 121 F.3d 1461, 1466, 43 USPQ2d 1481, 1484 (Fed.Cir.1997); <u>Markman</u>, 52 F.3d at 975.

Literal Infringement of the '532 patent

The jury determined that the Version 1 hanger tag literally infringes claims 8, 9, 14, 15, and 17 of the Claim 8, the independent claim from '532 patent. which the other infringed claims depend, claims the combination of a pair of eyeglasses and a hanger means for removably mounting the eyeglasses on a cantilevered support. The claim itself gives some structural definition of the hanger means as "including a body having aperture means adapted" for suspending the hanger and eyeglasses on the cantilevered support. Additionally, the hanger means includes an extension projecting from the bottom edge portion of the hanger body. This extension encircles the nose bridge of the eyeglasses. claim specifies that "fastening means in engagement with said extension" hold the extension in a closed loop. Figure 1 from the '532 patent illustrates these claimed features:



The district court determined that the "fastening means" was a means-plus-function element subject to the interpretation requirements of 35 U.S.C. § 112, ¶ 6 (1994). Consistent with that determination, the trial court instructed the jury that "the fastening means ... is either a rivet or a button and hole arrangement as shown in the '532 patent or the structural equivalents thereof." Neither party challenges this part of the district court's claim construction.

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*1316 [2] On appeal, VSI contends that its Version 1 hanger tag does not infringe because it does not include the "fastening means" required by claim 8. VSI's Version 1 hanger tag is a one-piece paper sticker having two large portions connected by a The entire back of the tag, narrow extension. including the extension, is coated with an adhesive. Backing paper covers the adhesive to prevent undesired adhesion. In use, a merchant removes the backing paper from the large portions of the tag. The extension (still covered with backing paper) then wraps around the nose bridge of the glasses. This wrapping glues the large portions together. In use, therefore, glue secures the two large portions of the tag to each other, leaving the narrow extension of the tag wrapped around the bridge of the eyeglasses.

The adhesive used by VSI is not identical to the fastening structure (namely, a rivet or button) described in the '532 patent. The jury, however, applying the rules of § 112, ¶ 6, determined that the VSI adhesive was equivalent to the structure disclosed in the specification. Accordingly, the jury returned a verdict of literal infringement of the '532 patent. VSI argues that substantial evidence does not support the jury's finding of literal infringement.

VSI first challenges the jury determination that adhesive is structurally equivalent to the mechanical fasteners disclosed in the specification of the '532 patent. Magnivision's technical expert, Mr. Anders, testified that, for one of ordinary skill in the art, it would be an insubstantial change "to substitute a rivet for a staple or for glue or for any other method that's standard in the [point of purchase] industry to maintain this loop as a closed loop." Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc., 145 F.3d 1303, 1309, 46 USPQ2d 1752, 1756-57 (Fed.Cir.1998) ("The proper test [for determining equivalence under § 112, ¶ 6] is whether the differences between the structure in the accused device and any disclosed in the specification insubstantial.... The question of known interchangeability is ... an important factor in determining equivalence [under § 112, ¶ 6]."). Mr. Anders further testified that the use of glue "in between the two layers of the body ... is an insubstantial change from the other structure ... which was one of a rivet. People in point of purchase displays use glue or rivets or staples to accomplish the same function." But see Chiuminatta, 145 F.3d at 1309 ("Almost by definition, two structures that perform the same function may be substituted for one another. The question of known interchangeability is not whether both structures serve the same

function, but whether it was known that one structure was an equivalent of another."). Mr. Anders additionally testified that "equivalent fastening means could be a rivet, glue or staple or some such similar [structure]." This testimony constitutes sufficient evidence to sustain the jury's verdict that persons of ordinary skill in the art consider glue an equivalent structure to those disclosed in the specification for maintaining a closed loop.

As a fallback position, VSI argues that, even if the glue is an equivalent of the rivet or button, Magnivision presented no evidence that the glue was "in engagement" with the extension as claim 8 requires. On cross examination, Mr. Anders identified the middle section of the Version 1 hanger tag as the "extension" element. Mr. Anders also identified the glue as the "fastening means" element. Because VSI leaves the backing paper on its extension (presumably to prevent the tag from adhering to the eyeglasses), VSI argues that its extension does not engage the fastening means as required by the claims of the '532 patent.

VSI's argument is unpersuasive. The claims of the '532 patent only require that the fastening means be "in engagement with" the extension. above, VSI coats the extension of its Version 1 hanger tag with glue--the fastening means identified by Mr. Anders. Furthermore, Mr. Anders' testimony explains that the extension and the glued portions are one integral piece. The jury could have interpreted *1317 his testimony to mean that the extension includes more than the narrow, middle portion of the Under this interpretation, the Version 1 tag. extension would also directly engage the glue fastening means. Alternatively, the jury could have determined that the extension is only the narrow portion of the Version 1 tag, but that the fastening means includes one of the two portions of the tag body in addition to the glue. Under any of these reasonable views of the accused product, the extension of the Version 1 hanger tag is in engagement with the glue fastening means as required by the claims.

[3] As the finder of fact, the jury receives deference for its function of weighing witness demeanor, credibility, and meaning. See Anderson v. City of Bessemer City, North Carolina, 470 U.S. 564, 575, 105 S.Ct. 1504, 84 L.Ed.2d 518 (1985) (factfinder entitled to deference on credibility determinations). Substantial evidence therefore supports the jury's verdict that VSI's Version 1 hanger tag literally infringes the '532 patent.

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Infringement of the '345, '726, and '911 Patents

The jury determined that VSI's Version 2 hanger tag and display rack did not literally infringe claims 1 and 2 of the '345 patent; claims 1 and 2 of the '726 patent; or claims 1, 2, and 3 of the '911 patent. The jury nevertheless found infringement of each of these claims under the doctrine of equivalents. Magnivision argues that the district court misconstrued these claims, and that, under the proper claim construction, VSI's products literally infringe these claims as a matter of law. VSI, on the other hand, embraces the district court's claim construction and argues that prosecution history estoppel precludes a finding of infringement under the doctrine of equivalents.

Claim 1 of the '345 patent and claim 1 of the '726 patent are similar. Both claim "[t]he combination of an eyeglass display member and an eyeglass hanger member." In each of these claims, this combination includes a "display member" with "cantilever support means" and "an eyeglass hanger member for mounting a pair of eyeglasses." Both claims further define the structure of the eyeglass hanger member. Claim 1 of the '345 patent describes the eyeglass hanger member as "made from flat sheet material," and having an "opening means formed ... below [its] upper edge." According to claim 1 of the '726 patent, the eyeglass hanger member has "an attaching portion attachable to a portion of said frame of said pair of eyeglasses to enable the temples of the frame [to be opened and closed]." Similarly, claim 2 of the '726 patent encompasses a "method of displaying eyeglass/hanger combinations ... the eyeglass hangers having an attaching portion attached to a portion of the frame of an associated pair of eyeglasses."

Claims 1, 2, and 3 of the '911 patent encompass a "combination of an eyeglass display member and an eyeglass contacting member." The '911 patent further describes the structure of the "eyeglass contacting member" as "having an encircling portion adapted to encircle a part of said frame of said pair of eyeglasses."

The district court construed the "eyeglass hanger member" element of the '345 patent as a means-plusfunction claim element subject to § 112, ¶ 6. Accordingly, the district court instructed the jury that "[t]he 'eyeglass hanger member for mounting a pair of eyeglasses' [in claim 1 of the '345 patent] is the body of the hanger disclosed in the '345 patent and its drawings and the structural equivalents thereof."

The district court similarly interpreted the "eyeglass hanger member" element of the '726 patent. The district court instructed the jury that "[t]he 'eyeglass hanger member for mounting a pair of eyeglasses' [in claim 1 of the '726 patent] is the hanger disclosed in the '726 patent and its drawings as having a body, an aperture, and an attaching portion and the structural equivalents thereof."

*1318 With respect to the '911 patent, the district court concluded that the "eyeglass contacting member" was a means-plus-function element. The district court therefore instructed the jury that the "eyeglass contacting member" is "the hanger disclosed in the '911 patent and its drawings having a body and an aperture and an 'encircling portion', and the structural equivalents thereof."

[4][5] This court reviews the district court's claim interpretation without deference. See Cybor Corp. v. FAS Technologies, Inc., 138 F.3d 1448, 1454-56, 46 USPQ2d 1169, 1172-75 (Fed.Cir.1998) (en banc); Markman, 52 F.3d at 979-81. This court has delineated several rules for claim drafters to invoke the strictures of 35 U.S.C. § 112, ¶ 6. Specifically, if the word "means" appears in a claim element in combination with a function, it is presumed to be a means-plus-function element to which § 112, ¶ 6 applies. See Sage Prods., Inc. v. Devon Indus., Inc., 126 F.3d 1420, 1427, 44 USPO2d 1103, 1109 (Fed.Cir.1997); Greenberg v. Ethicon Endo-Surgery, Inc., 91 F.3d 1580, 1583, 39 USPQ2d 1783, 1785 (Fed.Cir.1996). Nevertheless, according to its express terms, § 112, ¶ 6 governs only claim elements that do not recite sufficient structural limitations. See 35 U.S.C. § 112, ¶ 6. Therefore, the presumption that § 112, ¶ 6 applies is overcome if the claim itself recites sufficient structure or material for performing the claimed function. See Sage, 126 F.3d at 1427-28 ("[W]here a claim recites a function, but then goes on to elaborate sufficient structure, material, or acts within the claim itself to perform entirely the recited function, the claim is not in means-plus-function format."); York Prods., Inc. v. Central Tractor Farm & Family Ctr., 99 F.3d 1568, 1574, 40 USPQ2d 1619, 1623 (Fed.Cir.1996); Cole v. Kimberly-Clark Corp., 102 F.3d 524, 531, 41 USPQ2d 1001, 1006 (Fed.Cir.1996).

[6][7] Although use of the phrase "means for" (or "step for") is not the only way to invoke § 112, \P 6, that terminology typically invokes § 112, \P 6 while other formulations generally do not. See <u>Greenberg</u>. 91 F.3d at 1583-84. Therefore, when an element of a claim does not use the term "means," treatment as a

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means-plus-function claim element is generally not appropriate. See Mas-Hamilton Group v. LaGard, Inc., 156 F.3d 1206, 1213- 15, 48 USPQ2d 1010, 1016-18 (Fed.Cir.1998). However, when it is apparent that the element invokes purely functional terms, without the additional recital of specific structure or material for performing that function, the claim element may be a means-plus-function element despite the lack of express means-plus-function See, e.g., Cole, 102 F.3d at 531 language. ("[M]erely because an element does not include the word 'means' does not automatically prevent that element from being construed as a means-plusfunction element."); Mas-Hamilton, 156 F.3d at 1213-15 (interpreting "lever moving element" and "movable link member" under § 112, ¶ 6).

[8] Under this established analytical framework, the "eyeglass hanger member" elements in the claims of both the '345 and the '726 patents do not invoke § 112, ¶ 6. In the first place, these elements are not in traditional means-plus-function format. The word "means" does not appear within these elements. Moreover, although these claim elements include a function, namely, "mounting a pair of eyeglasses," the claims themselves contain sufficient structural limitations for performing those functions. As noted above, claim 1 of the '345 patent describes the eyeglass hanger member as "made from flat sheet material" with an "opening means formed ... below [its] upper edge." This structure removes this claim from the purview of § 112, ¶ 6. Similarly, according to claim 1 of the '726 patent, the eyeglass hanger member has "an attaching portion attachable to a portion of said frame of said pair of eyeglasses to enable the temples of the frame [to be opened and closed]." This structure also precludes treatment as a means-plus-function claim element. The district court *1319 therefore improperly restricted the "eyeglass hanger member" in these claims to the structural embodiments in the specification and their equivalents.

[9] The district court also erred in interpreting the "attaching portion attachable to a portion of said frame of said pair of eyeglasses" element of claim 1 of the '726 patent as a means-plus-function element. It instructed the jury that the "attachable portion" is "a mechanically fastened loop that goes around the nose bridge of the glasses as disclosed in the specification, or the structural equivalent thereof." Because this claim element is also not in traditional means-plus-function form and supplies structural, not functional, terms, the trial court erred by applying § 112, ¶ 6 to this claim element. This error caused the

district court to incorporate unduly restrictive structural limitations into the claim.

[10] For reasons similar to those discussed above with respect to the claim elements of the '345 and the '726 patents, the "eyeglass contacting member" element of the '911 patent claims is also not a meansplus-function element. Again, this claim element is not in traditional means-plus-function Furthermore, the claim itself recites sufficient structure for performing the recited function. Specifically, claim 1 of the '911 patent describes the "eyeglass contacting member" as "having an encircling portion adapted to encircle a part of said frame of said pair of eyeglasses to enable the temples of the frame to be selectively [opened and closed]." Similarly, claim 3 of the '911 patent describes the "eyeglass contacting member" as "having an attaching portion attachable to a portion of said frame of said eyeglasses." Therefore, the district court erred by applying § 112, ¶ 6 to these claim elements.

[11] Magnivision also complains that the district court erred in its construction of the language "means for securing a portion of said frame of said eyeglasses to said hanger member" in claim 1 of the '345 patent. With respect to this element, the district court instructed the jury that "[t]he 'means for securing' limitation is a mechanically fastened loop that goes around the nose bridge of the glasses ... or an equivalent thereof." The district court went on, however, to instruct the jury that "[t]he means for securing can be formed from a separate extension or integral extension and includes either the rivet fastener or the button and hole fastener." Magnivision argues that the district court should have included the phrase "or equivalents thereof" after "button and hole fastener" in its instruction to the jury. Absent this and the other claimed errors in the district court's interpretation of claim 1 of the '345 patent, Magnivision argues that the jury would have found literal infringement rather than infringement under the doctrine of equivalents.

The "means for securing" claim element is in conventional means-plus-function format without specific recital of structure and therefore invokes § 112, ¶ 6. The jury's finding of infringement of claim 1 of the '345 patent under the doctrine of equivalents indicates that the jury found every element of the claim literally or equivalently present in the accused device. The question before this court, therefore, is whether the jury's finding that the accused structure was equivalent to the "means for securing" element

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under the doctrine of equivalents, also indicates that it is equivalent structure under $\S 112, \P 6$.

This court has on several occasions explicated the distinctions between the term "equivalents" found in § 112, ¶ 6 and the doctrine of equivalents. See, e.g., Valmont Indus., Inc. v. Reinke Mfg. Co., 983 F.2d 1039, 1042-44, 25 USPQ2d 1451, 1453-56 (Fed.Cir.1993); Chiuminatta, 145 F.3d at 1310; Alpex Computer Corp. v. Nintendo Co., 102 F.3d 1214, 1222, 40 USPQ2d 1667, 1673-74 (Fed.Cir.1996); Dawn Equipment Co. v. Kentucky Farms Inc., 140 F.3d 1009, 1018-23, 46 USPQ2d 1109, 1115-18 (Fed.Cir.1998) (Plager, J., additional views) (Newman, J., additional views) (Michel, J., additional views). Indeed, the *1320 Supreme Court recently acknowledged distinctions between equivalents as used in § 112, ¶ 6 and the doctrine of See Warner-Jenkinson Co. v. Hilton equivalents. Davis Chem. Co., 520 U.S. 17, 27, 117 S.Ct. 1040, 1048, 137 L.Ed.2d 146, 41 USPQ2d 1865, 1870-71 (1997) ("[Equivalents under § 112, ¶ 6] is an application of the doctrine of equivalents in a restrictive role, narrowing the application of broad literal claim elements. [Section 112, ¶ 6] was enacted as a targeted cure to a specific problem.... The added provision, however, is silent on the doctrine of equivalents as applied where there is no literal infringement.")

[12] Section 112, ¶ 6 recites a mandatory procedure for interpreting the meaning of a means- or step-plusfunction claim element. These claim limitations "shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof." 35 U.S.C. § 112, ¶ 6. Thus, § 112, ¶ 6 procedures restrict a functional claim element's "broad literal language ... to those means that are 'equivalent' to the actual means shown in the patent specification." Warner-Jenkinson, 117 S.Ct. at 1048. Section 112, ¶ 6 restricts the scope of a functional claim limitation as part of a literal infringement analysis. See Pennwalt Corp. v. Durand-Wayland, Inc., 833 F.2d 931, 934, 4 USPQ2d 1737, 1739 (Fed.Cir.1987). Thus, an equivalent under § 112, ¶ 6 informs the claim meaning for a literal infringement analysis. doctrine of equivalents, on the other hand, extends enforcement of claim terms beyond their literal reach in the event "there is 'equivalence' between the elements of the accused product or process and the claimed elements of the patented invention." Warner-Jenkinson, 117 S.Ct. at 1045.

[13][14] One important difference between § 112, ¶

6 and the doctrine of equivalents involves the timing of the separate analyses for an "insubstantial change." As this court has recently clarified, a structural equivalent under § 112 must have been available at the time of the issuance of the claim. Chiuminatta, 145 F.3d at 1310. An equivalent structure or act under § 112 cannot embrace technology developed after the issuance of the patent because the literal meaning of a claim is fixed upon its issuance. An "after arising equivalent" infringes, if at all, under the doctrine of equivalents. Warner-Jenkinson, 117 S.Ct. at 1052; Hughes Aircraft Co. v. U.S., 140 F.3d 1470, 1475, 46 USPQ2d 1285, 1289 (Fed.Cir.1998). Thus, the temporal difference between patent issuance and infringement distinguish an equivalent under § 112 from an equivalent under the doctrine of equivalents. See Chiuminatta, 145 F.3d at 1310. In other words, an equivalent structure or act under § 112 for literal infringement must have been available at the time of patent issuance while an equivalent under the doctrine of equivalents may arise after patent issuance and before the time of infringement. See Warner-Jenkinson, 117 S.Ct. at 1053. arising" technology could thus infringe under the doctrine of equivalents without infringing literally as a § 112, ¶ 6 equivalent. [FN2] Furthermore, under § 112, ¶ 6, the accused device must perform the identical function as recited in the claim element *1321 while the doctrine of equivalents may be satisfied when the function performed by the accused device is only substantially the same. See Cybor, 138 F.3d at 1456; Hughes Aircraft, 140 F.3d at 1475.

> FN2. These principles, as explained in Chiuminatta Concrete Concepts, Inc. v. Cardinal Indus., Inc., 145 F.3d 1303, 46 USPQ2d 1752 (Fed.Cir.1998), suggest that title 35 will not produce an "equivalent of an equivalent" by applying both § 112, ¶ 6 and the doctrine of equivalents to the structure of a given claim element. A proposed equivalent must have arisen at a definite period in time, i.e., either before or after patent issuance. If before, a § 112, ¶ 6 structural equivalents analysis applies and any analysis for equivalent structure under the doctrine of equivalents collapses into the § 112, ¶ 6 analysis. If after, a non-textual infringement analysis proceeds under the doctrine of equivalents. Patent policy supports application of the doctrine of equivalents to a claim element expressed in means-plus-function form in the case of "after-arising" technology because a patent

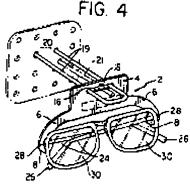
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draftsman has no way to anticipate and account for later developed substitutes for a claim element. Therefore, the doctrine of equivalents appropriately allows marginally broader coverage than § 112, ¶ 6.

[15] Although § 112, ¶ 6 and the doctrine of purpose equivalents are different in administration, "a finding of a lack of literal infringement for lack of equivalent structure under a means-plus-function limitation may preclude a finding of equivalence under the doctrine of equivalents." Chiuminatta, 145 F.3d at 1311. Both equivalence analyses, after all, apply "similar analyses of insubstantiality of the differences." Id. This confluence occurs because infringement requires, either literally or under the doctrine of equivalents, that the accused product or process incorporate each limitation of the claimed invention. See Warner-Jenkinson, 117 S.Ct. at 1049; Pennwalt, 833 F.2d at 935. Therefore, if an accused product or process performs the identical function and yet avoids literal infringement for lack of a § 112, ¶ 6 structural equivalent, it may well fail to infringe the same functional element under the doctrine of equivalents. See Chiuminatta, 145 F.3d at 1311. This same reasoning may be applied in reverse in certain circumstances. Where, as here, there is identity of function and no after-arising technology, a means-plus-function claim element that is found to be infringed only under the doctrine of equivalents due to a jury instruction failing to instruct on § 112, ¶ 6 structural equivalents is also literally present in the accused device.

VSI's Version 2 hanger tag has a central body and two arms, with one arm extending from each side of the body. Each arm has a hole near the end for receipt of an eyeglasses temple. The body also has an aperture through which a cantilever rod can be placed so the hanger tag can be hung from a display rack. VSI's Version 2 hanger tag is the subject of U.S. Patent No. 5,141,104 (the '104 patent). Figure 4 of the '104 patent illustrates these features.

FIG. 4.



As noted above, the doctrine of equivalents and structural equivalents under § 112, ¶ 6, though different in purpose and administration, can at times render the In this case, the jury found same result. infringement under the doctrine of equivalents. This finding presupposes that the jury found an equivalent for each element of the claimed invention, including the "means for securing ." The holes in the arms of VSI's Version 2 hanger tag secure a portion of the eyeglasses frame (the temples) to the hanger member and therefore perform the identical function of the claim element in question. The jury was instructed that the "means for securing" disclosed in the '345 patent "is a mechanically fastened loop that ... can be formed from a separate extension or integral extension and includes either the rivet fastener or the button and hole fastener." Based on this instruction, the jury found *1322 that the holes in the arms of the Version 2 hanger tag were equivalent to the mechanically fastened loop of the '345 patent under the doctrine of equivalents.

The parties do not dispute that the holes in the arms of the accused device perform a function identical to the extension of the patented device. Furthermore, the holes do not constitute an after-arising technology. Because the functions are identical and the holes are not an after-arising technology, the jury's finding of infringement under the doctrine of equivalents indicates that the jury found insubstantial structural differences between the holes in the arms of the Version 2 hanger tag and the loop of the '345 patent claim element. That finding is also sufficient to support the inference that the jury considered these to be structural equivalents under § 112, ¶ 6. For these reasons, any perceived error in the district court's jury instruction regarding the "means for securing" is, at most, harmless.

[16] Magnivision also argues that the district court improperly construed the "opening means" of claim 1

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of the '345 patent. The court instructed the jury that "[t]he 'opening means' is the elongated slot having a notch as described and depicted in the '345 patent, and the structural equivalents thereof." Citing Al-Site Corp. v. Bonneau Co., 22 F.3d 1107, 33 USPQ2d 1136, 1139 (Fed.Cir.1994), Magnivision argues that this court has already construed this structure to be "an enclosed hole and equivalents thereof."

For several reasons, Magnivision's reliance on Bonneau fails. First, as Magnivision admits, in Bonneau, this court construed claim 8 of the '532 patent, not the claims of the '345 patent. claims have different language and different meanings. Furthermore, Magnivision did not inform the trial court that Bonneau was a non-precedential opinion (in which Magnivision lost), which may only be cited for its issue preclusive effect against Magnivision. Finally, in Bonneau, Magnivision argued for a broader claim construction than that eventually adopted by this court. This litigation record gives no reason to think that the court rejected the district court's construction in this case, nor any reason to deny VSI the opportunity to seek a narrower construction. With regard to claim 1 of the '345 patent, the claim element "opening means for receiving cantilever support means and securing a horizontal orientation for the eyeglasses" invokes § 112, ¶ 6, and the district court correctly determined the scope of the claim.

[17] In a further attempt to overturn the jury verdict of infringement under the doctrine of equivalents with respect to the '345, '726, and '911 patents, VSI relies on prosecution history estoppel. This court has reviewed VSI's prosecution history estoppel argument and finds it unpersuasive. To overcome prior art objections by the Examiner, Magnivision amended what became claim 8 of the '532 patent to require that the extension project from the bottom edge portion of the hanger tag. Citing Mark I Marketing Corp. v. R.R. Donnelley & Sons Co., 66 F.3d 285, 291, 36 USPQ2d 1095, 1100 (Fed.Cir.1995), VSI argues that because all of Magnivision's patents arose from related applications, the same prosecution history estoppel applies to them VSI therefore contends that because the arms of its Version 2 hanger tag extend from the sides of the body of the tag, it cannot infringe the claims of these patents under the doctrine of equivalents as restricted by prosecution history While in some cases, the prosecution estoppel. history of a related application may limit application of the doctrine of equivalents in a later filed patent, in this case the specific limitation added in the claims of

an earlier issued patent is not present in the claims of the later issued patents. The '345, '726, and '911 patents all have limitations not found in the '532 patent and did not necessarily require the specific limitation added to the claims of the '532 patent to be patentable. The specific limitations added to gain allowance of the '532 patent are not included in and *1323 are therefore not relevant to determining the scope of the claims of the later issued patents.

In sum, the district court erred by interpreting several of the claim elements in the '345, '726 and '911 patents as means-plus-function elements subject to § 112, ¶ 6. Because, properly construed, these claims do not call for interpretation under § 112, ¶ 6, the district court's reading unnecessarily limited their scope. This court has cautioned against incorporating unwarranted functional or structural limitations from the specification into the claims. See Transmatic, Inc. v. Gulton Indus., Inc., 53 F.3d 1270, 1277, 35 USPQ2d 1035, 1041 (Fed.Cir.1995). Despite the district court's unwarranted restriction of the claims, the jury found infringement under the doctrine of equivalents. Although a reasonable dispute as to the application of the correctly interpreted claims to the accused structure prevents a determination of literal infringement as a matter of law, because the jury found infringement under the trial court's more restricted reading of the claims, this court need not remand for an infringement determination according to this court's broader claim interpretation. Proceeding claim element by claim element, the jury has already found infringement. This court's correction of the claim scope does not disturb that determination.

Validity of the '532, '345, '726, and '911 patents

VSI challenges the validity of all four Magnivision patents under 35 U.S.C. § 103. Specifically, VSI asserts that these patents are obvious in light of U.S. Patent No. 3,738,034 (the Seaver patent) or the 1984 B & G catalog and the knowledge of one of ordinary skill in the art. VSI also asserts obviousness based on the Rosen patent (U.S. Patent No. 3,291,300), the Pacelli patent (U.S. Patent No. 3,116,529), and German Design Patent No. G 8,212,306.3 U1 (the German patent). On appeal, VSI particularly urges that the Cool-Ray catalogs (which depict the commercial embodiment of the Seaver patent), when viewed with the knowledge of one of ordinary skill in the art, render all of the disputed claims invalid for obviousness. The jury considered and rejected VSI's claims of invalidity.

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[18][19] Although the determination of obviousness is ultimately a legal conclusion, it rests on underlying factual determinations. See Graham v. John Deere Co., 383 U.S. 1, 17-18, 86 S.Ct. 684, 15 L.Ed.2d 545, 148 USPQ 459, 467 (1966). Issued patents have a strong presumption of validity in infringement proceedings. See 35 U.S.C. § 282 (1994). Hence, an accused infringer who defends on grounds of patent invalidity bears the burden of showing patent invalidity by clear and convincing evidence. See Monarch Knitting Mach. v. Sulzer Morat GMBH, 139 F.3d 877, 881, 45 USPQ2d 1977, 1981 (Fed.Cir.1998).

[20] In a challenge based on obviousness under 35 U.S.C. § 103, the person alleging invalidity must show prior art references which alone or combined with other references would have rendered the invention obvious to one of ordinary skill in the art at the time of invention. See Dennison Mfg. Co. v. Panduit Corp., 475 U.S. 809, 810, 106 S.Ct. 1578, 89 L.Ed.2d 817, 229 USPQ 478, 479 (1986); Rockwell Int'l Corp. v. United States, 147 F.3d 1358, 1364, 47 USPQ2d 1027, 1032 (Fed.Cir.1998). "presumption of validity under 35 U.S.C. § 282 carries with it a presumption that the Examiner did his duty and knew what claims he was allowing." Intervet Am., Inc. v. Kee-- Vet Labs., Inc., 887 F.2d 1050, 1054, 12 USPQ2d 1474, 1477 (Fed.Cir.1989). Therefore, the challenger's "burden is especially difficult when the prior art was before the PTO examiner during prosecution of the application." Hewlett-Packard Co. v. Bausch & Lomb Inc., 909 F.2d 1464, 1467, 15 USPQ2d 1525, 1527 (Fed.Cir.1990).

[21] The party seeking patent invalidity based on obviousness must also show some motivation or suggestion to combine *1324 the prior art teachings. See <u>In re Rouffet</u>, 149 F.3d 1350, 1355, 47 USPQ2d 1453, 1457 (Fed.Cir.1998); <u>Motorola</u>, 121 F.3d at 1472. A suggestion or motivation to combine generally arises in the references themselves, but may also be inferred from the nature of the problem or occasionally from the knowledge of those of ordinary skill in the art. See Rouffet, 149 F.3d at 1355.

[22] In this case, the United States Patent and Trademark Office (the PTO) considered nearly all the prior art that VSI asserts renders Magnivision's patents obvious. The PTO considered the Seaver patent during its prosecution of the applications for each of the '345, '726, and '911 patents. The B & G catalog was before the PTO in the application that led to the '911 patent. Moreover, the structure of the B &

G reference appears in the Smilow Patent (U.S. Patent No. 3,710,996) which was cited against each of these patents. All of the other references, except the Rosen patent, which is similar to the German patent, were before the PTO in the examinations of one or more of the Magnivision patent applications.

The Seaver patent is the most pertinent prior art. The Seaver patent discloses a security tag for eyeglasses. The Seaver tag is used as an anti-theft device in conjunction with prior art displays. these displays, the temples of the eyeglasses are not folded, but rather extend through openings in the The Seaver security tag is not a hanger display tag and is not designed nor intended to have a cantilevered support extend through it. Neither does the Seaver patent suggest stacking a plurality of folded eyeglasses on a cantilevered support. Seaver security tag does, however, disclose some elements of the claimed invention, such as a loop that secures the tag to the eyeglasses. Nevertheless. although the Seaver patent discloses some of the elements recited in the Magnivision patents' claims, it does not disclose the display member, the cantilevered support, or the aperture for mounting the hanger tag on the cantilevered support.

[23] VSI argues that it would have been obvious to one of ordinary skill in the art to punch a hole in the Seaver security tag and hang it from a cantilevered support. VSI points to the problems in the art and the Rosen, German, and Pacelli patents to support this conclusion. VSI is unable, however, to point to any specific teaching or suggestion for making this combination. VSI instead relies on what it presumes is the level of knowledge of one of ordinary skill in the art at the time of the invention to supply the missing suggestion to combine. In the first place, the level of skill in the art is a prism or lens through which a judge or jury views the prior art and the claimed invention. This reference point prevents these deciders from using their own insight or, worse yet, hindsight, to gauge obviousness. Rarely, however, will the skill in the art component operate to supply missing knowledge or prior art to reach an obviousness judgment. See W.L. Gore & Assocs., Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed.Cir.1983) ("To imbue one of ordinary skill in the art with knowledge of the invention in suit, when no prior art reference or references of record convey or suggest that knowledge, is to fall victim to the insidious effect of a hindsight syndrome wherein that which only the inventor taught is used against its teacher."). Skill in the art does not act as a bridge over gaps in

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substantive presentation of an obviousness case, but instead supplies the primary guarantee of objectivity in the process. *See Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718, 21 USPQ2d 1053, 1057 (Fed.Cir.1991).

The level of skill in the art is a factual determination. See Graham, 383 U.S. at 17-18. Because the jury considered and rejected VSI's challenge on this grounds, it evidently concluded that one of ordinary skill in the art would not have known to make this combination. This factual finding is supported by substantial evidence. *1325 VSI's argument in this regard is therefore an impermissible effort at hindsight recreation. See Grain Processing Corp. v. American Maize-Prods. Co., 840 F.2d 902, 5 USPQ2d 1788, 1792 (Fed.Cir.1988).

The German patent (and the similar Rosen patent) disclose theft-resistant display tags for sunglasses. These display tags are essentially plastic cards with holes for receiving the temples of the sunglasses and another hole for hanging them on a cantilevered In some ways, they are similar to the support. Magnivision patents. In other ways, however, they are quite different. Dr. Chrycy, an expert optometrist, explained that the device disclosed in the German patent would not be suitable as a display tag for reading eyeglasses because it does not allow a person trying them on to determine if they are the The plastic card of the German correct strength. display tag interferes with the proper fit of the eyeglasses and therefore would result in visual distortions or blurring. The Rosen patent has similar drawbacks.

The Pacelli patent also discloses a theft-resistant tag for displaying sunglasses. To secure the glasses, the Pacelli patent uses a sheet of plastic which covers the frame and impairs the view of a person trying on the glasses. Dr. Chrycy testified that this would result in alteration of the view through the lenses and would therefore not serve as a reading glasses display tag.

The B & G catalog primarily discloses belt hangers. Although the catalog discloses possible use of these hangers for eyeglasses, Mr. Hallerman, another expert, testified that they could not be used effectively for holding eyeglasses because they lacked the necessary stability.

Magnivision further supports the jury's factual findings related to nonobviousness with record evidence of secondary considerations. These secondary considerations, such "as commercial

success, long felt but unresolved needs, failure of others, etc.," also provide objective proof of nonobviousness. <u>Dennison</u>, 475 U.S. at 810. The record shows the commercial success of the claimed invention, including demonstration of a nexus between the commercial success and the patented invention, and evidence of a long felt need for a solution to several of the problems addressed by the invention.

Mort Nyman, an expert in the design, development and marketing of nonprescription reading glasses, testified regarding the problems experienced with prior art eyeglass hangers. He further testified that efforts prior to Magnivision's invention were unsuccessful in solving these problems. Prior art displays were bulky and incapable of displaying several pairs of eyeglasses at the same vertical position. Prior art displays contained openings for insertion of the temples of the eyeglasses and therefore allowed only one pair of eyeglasses per vertical position. Because fewer glasses fit on the prior art displays, vendors had to frequently refill the display rack. Moreover, prior art theft-resistant displays prevented potential customers effectively trying on the eyeglasses.

Magnivision overcame the deficiencies of the prior art by developing a hanger tag which does not interfere with the opening and closing of the temples or distort the view of the user through the eyeglasses. Furthermore, Magnivision's hanger tags featured an aperture for mounting on a cantilevered support. In this way, several pairs of eyeglasses of the same magnification strength could fit on the display together. Due to this design, store managers no longer needed to frequently refill the eyeglass display rack. For these reasons, the theft-resistant hanger tags disclosed in the Magnivision patents satisfied the long-felt needs of the industry.

Magnivision also presented evidence of commercial success, which further tended to establish the nonobviousness of the claimed inventions. Particularly, Magnivision presented evidence showing that all of the retail chains that sold Magnivision glasses wanted to switch from the prior art displays to Magnivision's patented displays. Magnivision also presented evidence *1326 showing that as a direct result of Magnivision's patented inventions, the number of locations selling Magnivision eyeglasses more than doubled. evidence of commercial success further strengthened the district court's determination that the Magnivision patents were not obvious. The factual findings made

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by the jury underlying this determination are supported by substantial evidence.

Based on the evidence presented at trial, the jury found that VSI failed to provide clear and convincing evidence of obviousness. Because the finding of obviousness rests on underlying factual determinations, which the jury found adverse to VSI, the district court correctly concluded that the Magnivision patents are not invalid under 35 U.S.C. § 103.

Trade Dress Infringement

[24][25] For areas of law, such as trademark and trade dress infringement, which are not unique to this court's jurisdiction, this court applies the law of the pertinent regional circuit, in this case the United States Court of Appeals for the Eleventh Circuit. See Pro-Mold and Tool Co. v. Great Lakes Plastics, Inc., 75 F.3d 1568, 1574, 37 USPQ2d 1626, 1631 (Fed.Cir.1996). Under Eleventh Circuit law, a finding of trademark and trade dress infringement is a question of fact. See AmBrit, Inc. v. Kraft, Inc., 812 F.2d 1531, 1535 (11th Cir.1986). A jury verdict of trademark or trade dress infringement is therefore reviewed for substantial evidence. See John H. Harland Co. v. Clarke Checks, Inc., 711 F.2d 966, 973, 219 USPQ 515, 522 (11th Cir.1983). Legal determinations of the district court, however, receive no deference on review. See <u>Lucero v. Trosch</u>, 121 F.3d 591, 599 (11th Cir.1997).

[26][27] Trade dress protection embraces the total image of the product including such factors as the size, shape, and color of the product's packaging and appearance. See Two Pesos, Inc. v. Taco Cabana, Inc., 505 U.S. 763, 765 n. 1, 112 S.Ct. 2753, 120 L.Ed.2d 615, 23 USPQ2d 1081, 1082 n. 1 (1992). To prove trade dress infringement, the plaintiff must show: (1) the inherent distinctiveness or secondary meaning of its trade dress, (2) the essential nonfunctionality of its trade dress, and (3) the likelihood of consumer confusion as to origin, sponsorship, or approval due to similarity between its and the defendant's trade dress. See University of Fla. v. KPB, Inc., 89 F.3d 773, 776-77, 39 USPQ2d 1603, 1605 (11th Cir.1996). Because this is a conjunctive test, failure to prove even one of these elements precludes a showing of trade dress infringement. Therefore, the defendant can secure a summary judgment of noninfringement demonstrating that the plaintiff cannot show any element of the cause of action.

[28][29][30][31] As mentioned above, protection hinges on the distinctiveness or secondary meaning of the trade dress. Distinctive trade dress enables consumers to distinguish a product from others and identify that product with its source. See id. at 776 n. 5. The Eleventh Circuit gauges distinctiveness based on whether trade dress "[is] a 'common' basic shape or design, whether it [is] unique or unusual in a particular field, [and] whether it [is] a mere refinement of a commonly adopted and well-known form of ornamentation for a particular class of goods viewed by the public as a dress or ornamentation for the goods." Id. (quoting AmBrit, 812 F.2d at 1536). Trade dress can also satisfy this requirement by showing secondary meaning, or a "connection in the consumer's mind between the mark and the product's producer, whether that producer is known or unknown." Id. The plaintiff may show secondary meaning in several ways. The plaintiff may show secondary meaning with consumer surveys and with evidence of lengthy and uniform display of the dress. See Conagra, Inc. v. Singleton, 743 F.2d 1508, 1513, 224 USPQ 552, 555-56 (11th Cir.1984). plaintiff may also show secondary meaning with evidence of the plaintiff's efforts--usually through advertising--*1327 to establish in the minds of the consumers a connection between the trade dress and its product. See id. Finally, the plaintiff may use other evidence showing consumers' association of the trade dress with the plaintiff or its product to prove secondary meaning. See id.

[32] Trade dress must also be primarily nonfunctional. A trade dress is functional "if it is essential to the use or purpose of the article or if it affects the cost or quality of the article," *Inwood Labs., Inc. v. Ives Labs., Inc.,* 456 U.S. 844, 850 n. 10, 102 S.Ct. 2182, 72 L.Ed.2d 606, 214 USPQ 1, 4 n. 10 (1982), such that its protection would place a competitor at a significant disadvantage, *see Qualitex Co. v. Jacobson Prods. Co.,* 514 U.S. 159, 165, 115 S.Ct. 1300, 131 L.Ed.2d 248, 34 USPQ2d 1161, 1165 (1995).

[33] Trade dress protection also requires evidence of a likelihood of confusion between the plaintiff's and the defendant's trade dress. Determining whether a likelihood of confusion exists requires weighing several factors: (1) the nature of the plaintiff's mark, (2) the similarity of the marks, (3) the similarity of the products the marks represent, (4) the similarity of the parties' retail outlets and customers, (5) the similarity of the parties' advertising, (6) the defendant's intent to copy or imitate the plaintiff's mark, and (7) the extent of actual confusion. See

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Wesco Mfg., Inc. v. Tropical Attractions of Palm Beach, Inc., 833 F.2d 1484, 1488, 5 USPQ2d 1190, 1193-94 (11th Cir.1987).

The jury found that VSI infringed Magnivision's display card and blister pack trade dress, Magnivision's color coding trade dress, and Magnivision's eyeglass styles and colors trade dress. Each of these trade dresses requires separate analysis.

Display Card/Blister Pack Trade Dress

[34][35] Magnivision used a particular display card and blister pack to market its hand-held magnifiers. The display card contains a bold red stripe along its right-hand side and a gray and white cross-hatched background over the remainder of the card. evidence of distinctiveness of this trade dress, Magnivision presented testimony by Morton Nyman, its president, "that Magnivision is the only company that used this design until it was copied by VSI." Magnivision's use of a display design different from others, however, does not suffice to show distinctiveness in the minds of consumers. Rather, sole use of a design is a preliminary step for a descriptive trade dress to acquire distinctiveness and secondary meaning. See In re Owens-Corning Fiberglas Corp., 774 F.2d 1116, 1125, 227 USPQ 417, 422 (Fed.Cir.1985) ("An evidentiary showing of secondary meaning ... includes evidence of the trademark owner's method of using the mark, supplemented by evidence of the effectiveness of such use to cause the purchasing public to identify the mark with the source of the product.").

In this case, Magnivision did not supply evidence of distinctiveness or secondary meaning. Although Magnivision presented some testimony of sole use, the facts belie any acquisition of secondary meaning. A review of some factors related to secondary meaning show the inadequacy of Magnivision's showing. For instance, with regard to the length and manner of the trade dress use, the record shows that Magnivision used its display design for only two years. Moreover, Magnivision discontinued use of the design two years before VSI put their allegedly infringing packaging on the market. With respect to the nature and extent of advertising and promotion-the efforts by the plaintiff to promote a conscious connection in the public's mind between the trade dress and the plaintiff's business--the record shows that Magnivision made significant promotional None of these expenditures or expenditures. activities, however, was tied to the display card trade The record also contained no evidence that

consumers actually recognized Magnivision's allegedly distinctive trade dress for hand-held magnifiers.

*1328 Without evidence of distinctiveness or secondary meaning beyond its assertion of sole use, no reasonable juror could have found that Magnivision's design had acquired secondary meaning. Hence, Magnivision did not supply enough evidence of this first requirement for trade dress infringement to support the jury's verdict. This conclusion alone precludes a finding of trade dress infringement on the display card. Nonetheless, a brief review of the evidence of likelihood of confusion underscores this court's determination.

As mentioned earlier, the likelihood of confusion analysis requires consideration of several factors. In this case, although the consumers and markets were similar, the packaging was not. Comparison of the two packages shows distinct differences in appearance. Specifically, both the graphics and color scheme are different. VSI's accused packaging does not contain either the bold red stripe or the cross-hatched gray and white background of Magnivision's asserted trade dress. VSI's display card contains a dark black band across the top, with gray and blue stripes covering the remainder of the Additionally, VSI's ACURAVISION trademark is prominently displayed in the top black Furthermore, VSI's accused display card contains other distinctive features such as a broad blue arrow and MAGNA.DOT trademark under the lens of the magnifier.

Perhaps because of the substantial differences between the accused packaging and Magnivision's asserted trade dress, Magnivision did not produce any evidence of actual customer confusion. The record as a whole lacks evidence to support the jury's finding of a likelihood of consumer confusion.

No reasonable juror could have found trade dress infringement of the display cards. Because the district court based its injunction prohibiting similar display cards on other accessories on the jury's finding of display card infringement, the district court abused its discretion in enjoining the use of the accessory packages.

Color Coding Trade Dress

[36] The jury also found that VSI had infringed Magnivision's trade dress in its color coding system. This alleged trade dress is an array of horizontal

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color-coded stripes on Magnivision's eyeglass hanger tags which identify the power of the glasses. Under this system, the hangers for eyeglasses of a particular power would feature a particular color. Eyeglasses of a different power would hang from a tag with a different color.

[37] At the outset, the record does not contain sufficient evidence to show any distinctiveness or secondary meaning for Magnivision's color coding system. Color itself is not inherently distinctive. See Qualitex, 514 U.S. at 163 ("[O]ver time, customers may come to treat a particular color on a product or its packaging (say, a color that in context seems unusual, such as pink on a firm's insulating material or red on the head of a large industrial bolt) as signifying a brand."). Thus, to support its finding of infringement, the jury must have found secondary meaning in this color-coding system. The record, however, discloses no evidence to support such a finding.

[38] Other companies used color coding to market non-prescription reading glasses for many years. Thus, Magnivision has a significant burden to show that its particular color-coding system had acquired source-identifying significance in the minds of the consuming public. Magnivision's burden becomes almost insurmountable in light of the evidence showing that its coloring system changed from time to time. "Absent a specifically defined, color-definite, and *stable* visual appearance, an alleged trade dress cannot receive protection." *Keystone Camera Prods. Corp. v. Ansco Photo-Optical Prods. Corp.*, 667 F.Supp. 1221, 1229, 3 USPQ2d 1797, 1802 (N.D.III.1987) (emphasis added).

Although the actual colors Magnivision associated with particular diopter strengths did not change significantly, *1329 Magnivision changed its coding method several times. At various times Magnivision used three different ways to signify diopter strength: the color of the diopter numbers, a horizontal stripe of color across one side of the tag, or a colored rectangle. Without a stable visual appearance and absent any other evidence of consumer identification of the Magnivision's color-coding system, no reasonable juror could conclude that the stripe of color now asserted as a trade dress has acquired secondary meaning.

Furthermore, even if Magnivision could show secondary meaning in its color coding system, color coding cannot act as an indicator of source because it is primarily functional. See <u>Two Pesos</u>, 505 U.S. at

775 (trade dress is functional if it "is one of a limited number of equally efficient options available to competitors and free competition would be hindered by according the design trademark protection"); Spraying Sys. Co. v. Delavan, Inc., 762 F.Supp. 772, 781, 19 USPQ2d 1121, 1128 (N.D.III.1991), aff'd, 975 F.2d 387, 24 USPQ2d 1181 (7th Cir.1992) ("color coding as an identification system is clearly functional"). In this case, the record shows that Magnivision used color coding to indicate diopter strength, not to indicate source. Magnivision itself stated that color coding allows the racks to be serviced more easily, aids consumers in selecting the correct diopter, and reduces the time and cost of restocking the glasses. Additionally, as noted earlier, color coding serves these same cost-saving functions for many competitors in the nonprescription eyeglass industry. To give one competitor an exclusive right to practice color-coding would give it a significant advantage over other companies.

Because color coding is primarily functional, the record refutes the jury's verdict of trade dress infringement of Magnivision's color coding system. On the basis of this record, this court concludes that no reasonable juror could have found trade dress infringement of Magnivision's color coding scheme because of the functional nature of the trade dress and the lack of showing of secondary meaning. This court, therefore, need not proceed to examine the likelihood of confusion. Because the jury verdict of trade dress infringement lacks substantial evidence, the district court abused its discretion by enjoining VSI's use of its hanger tag labels based on trade dress infringement.

Eyeglass Styles and Colors Trade Dress

[39] The jury also found that VSI infringed the trade dress of six of Magnivision's eyeglass styles. Once again, however, the record contains insufficient evidence that Magnivision's colors or styles were inherently distinctive or possessed secondary Mr. Nyman testified that Magnivision meaning. purchased its allegedly distinctive styles from publicly available molds. VSI purchased its accused styles from publicly available stock as well. evidence of the public availability of Magnivision's product raises significant hurdles to a finding that its styles are inherently distinctive as an indicator of source. See Mana Prods., Inc. v. Columbia Cosmetics Mfg., Inc., 65 F.3d 1063, 1070, 36 USPQ2d 1176, 1180 (2nd Cir.1995) (When similar packaging can be purchased by other companies and

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is publicly available, "it defies simple logic to suggest that the packaging was inherently distinctive.").

Magnivision produced no evidence of secondary The record demonstrates that it changed meaning. its styles to suit demand. Constantly changing styles rarely demonstrate the stability necessary for the public to identify those particular characteristics with a particular source. See, e.g., Keystone, 667 F.Supp. at 1226 (identifying the significant weakness in the plaintiff's trade dress claim as being that the Le Clic "look" was "nothing more than a reflection of the fashion trends taking place generally in the marketplace of youthful consumers."). Thus, the record shows that the publicly available, constantly changing styles of Magnivision's eyeglasses lacked secondary meaning.

*1330 Without inherent distinctiveness or secondary meaning, Magnivision's eyeglass styles and colors lacked a protectable trade dress. Absent a protectable trade dress, no reasonable juror could find trade dress infringement.

Trademark Infringement of the MAGNIVISION mark

[40][41] The found iury that VSI's mark MAGNA.DOT infringes Magnivision's MAGNIVISION mark. To prove trademark infringement, a trademark owner must show a likelihood that consumers would confuse the defendant's mark with the protected mark. Dieter v. B & H Indus. of Southwest Fla., Inc., 880 F.2d 322, 326, 11 USPQ2d 1721, 1723 (11th Cir.1989). The Eleventh Circuit identifies several factors which contribute to a likelihood of confusion finding: (1) the nature of the plaintiff's mark, (2) the similarity of the marks, (3) the similarity of the products represented by the marks, (4) the similarity of the retail outlets and consumers, (5) the nature and extent of the parties' advertising, (6) the defendant's intent to copy the plaintiff's mark, and (7) the extent of actual confusion. See Wesco, 833 F.2d at 1488; Coach House Restaurant, Inc. v. Coach and Six Restaurants Inc., 934 F.2d 1551, 1561, 19 USPQ2d 1401, 1409 (11th Cir.1991). Other relevant factors include the strength of the marks, the number and nature of similar marks in use on similar goods, the nature and extent of any actual confusion and the length of time during and conditions under which there has been concurrent use without evidence of actual confusion. See In re E.I. DuPont DeNemours & Co., 476 F.2d 1357, 1361, 177 USPQ 563, 567 (CCPA 1973).

[42] Similarity of the marks is a hallmark of consumer confusion. See E. Remy Martin & Co., S.A. v. Shaw-Ross Int'l Imports, Inc., 756 F.2d 1525, 1531, 225 USPQ 1131, 1135 (11th Cir.1985) ("In evaluating the similarity of marks, we must consider ... the appearance, sound and meaning of the marks, as well as the manner in which they are displayed."). In this instance, however, the marks do not present a similar sound, meaning, or commercial impression. The MAGNIVISION mark is a single word; the MAGNA.DOT mark consists of two words separated by a darkened circle. The MAGNIVISION mark has four syllables; the MAGNA.DOT mark has three. The MAGNIVISION mark displays eleven letters, the last seven of which do not appear in the MAGNA.DOT mark; the MAGNA.DOT mark has eight letters and a dot.

The only similarity between the marks is the MAGNA/MAGNI prefix. The record shows. however, that the MAGNA/MAGNI prefix as well as the VISION suffix enjoy wide use in the eyeglass industry on similar goods and services. evidence included a number of registered trademarks for magnification lenses and eyeglasses (i.e., MAGNA ADD, MAGNA THIN, MAGNA-BAR, MAGNA-COM, MAGNA-LITE, MAGNA-PAGE, MAGNA-RULE, MAGNA-SIGHTER, MAGNATEL, MAGNI-FOCUSER, MAGNI-LENS, MAGNI-SPECS. MAGNI-STAT, MAGNI-VIEWER, COOPERVISION, VALLEN VISION, ACURAVISION, CLEAR VISION, COOP VISION, COYOTE VISION, CRYSTAL VISION, POWER TRUVISION, VISION, SELECT-A-VISION, ULTRAVISION). The common usage of these descriptive terms weighs strongly against a finding of likelihood of confusion. See, e.g., Sun Banks of Fla., Inc., v. Sun Fed. Sav. & Loan Ass'n, 651 F.2d 311, 316, 211 USPQ 844, 849 (5th Cir.1981) ("[W]e find the extensive third-party use of the word 'Sun' impressive evidence that there would be no likelihood of confusion between Sun Banks and Sun Federal.").

The record shows that these trademarks appeared side-by-side on similar products and in similar retail outlets over a period of several years. Magnivision's own documents allege that MAGNIVISION "has become the generic term for [over-the-counter] reading glasses." Also, Magnivision made extensive advertising expenditures to promote the recognition of its mark. Nonetheless, the record contains *1331 no showing of actual confusion between the two marks.

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The differences in the marks, the absence of actual confusion despite several years of simultaneous use in an identical market, the absence of evidence that VSI intended to copy Magnivision's mark, and the weakness of the descriptive MAGNIVISON mark add up to a finding of noninfringement as a matter of law. Accordingly, this court holds that no reasonable juror could have found infringement of the MAGNIVISION trademark by the MAGNA.DOT mark.

Unfair Competition

[43][44] Because the only evidence of unfair competition in this case was Magnivision's claims of trademark and trade dress infringement, the jury's finding of unfair competition lacks substantial evidence. Unfair competition provides an additional degree of protection above that provided by trademark and trade dress law. See <u>Freedom Sav. & Loan Ass'n v. Way. 757 F.2d 1176, 1186, 226 USPQ 123, 130 (11th Cir.1985)</u>. Although trademark and trade dress infringement may be the basis for a claim of unfair competition, it frequently requires the court to examine additional conduct that would not give rise to a claim of trademark infringement. See id.

In this case, the only evidence in support of the unfair competition claims was the trademark and trade dress infringement claims. As stated earlier, no reasonable juror could find a likelihood of confusion between the trade dress and trademarks of VSI and Magnivision. Therefore, on the evidence presented, no reasonable juror could find that VSI engaged in unfair competition with Magnivision.

Personal Liability of Myron Orlinsky

[45] Title 35 authorizes a finding that an officer of a corporation is personally liable for the corporation's acts of infringement. See 35 U.S.C. § 271(a) (1994); Manville Sales Corp. v. Paramount Sys., Inc., 917 F.2d 544, 552, 16 USPQ2d 1587, 1593 (Fed.Cir.1990). Personal liability under § 271(a), however, requires sufficient evidence to justify piercing the corporate veil. See id. The corporate entity deserves respect and legal recognition unless specific, unusual circumstances justify disregarding the corporate structure. See id. The most common reason for disregarding the corporate structure is that the "corporation was merely the alter ego of its officers." Id.

[46] The record shows that Myron Orlinsky made

the sole decision to continue using the hanger tags after VSI received cease and desist letters from Magnivision. The record, however, shows no further evidence of personal activity by Mr. Orlinsky. This evidence does not establish that Mr. Orlinsky overstepped his authority as CEO of VSI. Rather the record shows that Mr. Orlinsky acted consistent with his authority as CEO. Therefore, the record only supports the conclusion that Mr. Orlinsky acted within and according to the strictures of the corporate structure. The record shows no instance of the corporation operating as Mr. Orlinsky's alter ego. Thus, the record contains no evidence to justify piercing the corporate veil. See, e.g., id. at 553 ("Although these facts support the conclusion that the officers had knowledge of their acts, these acts were within the scope of their employment and thus were protected by the corporate veil.")

Furthermore, after VSI received the cease and desist letter, Mr. Orlinsky consulted counsel before continuing to produce the Version 1 and 2 hanger tags. The record thus shows that Mr. Orlinsky acted pursuant to a good faith belief of noninfringement engendered by advice of counsel. Once again, this evidence does not justify rejecting legal recognition of the corporate structure. See id. at 553. In sum, the record does not contain sufficient evidence that Mr. Orlinsky acted outside of the scope of his employment or that he continued to manufacture the hanger *1332 tags knowing that they infringed Magnivision's patents.

IV.

In conclusion, although the district court erred in its construction of the claims of the '345, '726 and '911 patents, these errors were harmless because of the jury's finding of infringement under the doctrine of equivalents. This court therefore affirms the district court's decision not to grant judgment as a matter of law of non-infringement. The jury's findings with respect to trademark and trade dress infringement, however, are unsupported by substantial evidence. Furthermore, because the finding of unfair competition rested solely on the findings of trademark and trade dress infringement, that finding is also unsupported by substantial evidence. The district court therefore erred in failing to grant judgment as a matter of law that VSI did not infringe Magnivision's asserted trademark and trade dress and that it did not engage in unfair competition. court therefore reverses the decision of the district court not to grant judgment as a matter of law with respect to the absence of trademark and trade dress

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infringement and the absence of unfair competition. Additionally, because the jury findings of trademark and trade dress infringement and unfair competition lacked substantial evidence, the district court's entry of a permanent injunction was an abuse of discretion. The district court's entry of the permanent injunction is thus vacated to the extent it prohibited VSI from using its accused trademark, display cards and hanger tag color coding scheme. Furthermore, there is insufficient evidence to support holding Mr. Orlinsky personally liable for the damage award. The district court's conclusion to the contrary is therefore reversed.

COSTS

Each party shall bear its own costs.

AFFIRMED-IN-PART and REVERSED-IN-PART.

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Briefs and Other Related Documents (Back to top)

- 1999 WL 33645062 (Appellate Brief) Brief by Appellants Al-Site Corporation and Magnivision, Inc. in Opposition to Combined Petition for Panel Rehearing and for Rehearing En Banc (May. 13, 1999)Original Image of this Document (PDF)
- 1998 WL 34097788 (Appellate Brief) Reply Brief of Defendants-Cross Appellants VSI International Inc. and Myron Orlinsky (Apr. 15, 1998)Original Image of this Document (PDF)
- 1998 WL 34097790 (Appellate Brief) Reply and Opposition Brief of Appellants Al-Site Corporation and Magnivision, Inc. (Mar. 06, 1998)Original Image of this Document (PDF)
- 1998 WL 34097792 (Appellate Brief) Brief of Defendants-Cross-Appellants VSI International Inc. and Myron Orlinsky (Jan. 20, 1998)Original Image of this Document (PDF)
- 1997 WL 33544957 (Appellate Brief) Brief for Appellants Al-Site Corporation and Magnivision, Inc. (Dec. 10, 1997)Original Image of this Document with Appendix (PDF)

END OF DOCUMENT



733 F.2d 900 733 F.2d 900, 221 U.S.P.Q. 1125 (Cite as: 733 F.2d 900)

C

United States Court of Appeals, Federal Circuit.

In re Lucas S. GORDON and Karl M. Sutherland.

Appeal No. 83-1281. Serial No. 124312.

May 10, 1984.

Appeal was taken from a decision of the United States Patent and Trademark Office Board of Appeals affirming an examiner's rejection of appellants' claims one to three and five to seven of application serial No. 124,312 relating to a blood filter assembly. The Court of Appeals, Jack R. Miller, Circuit Judge, held that Board failed to establish a prima facie case of obviousness with regard to the claims in issue.

Reversed.

West Headnotes

Patents 6 16.17

291k16.17 Most Cited Cases

Patent and Trademark Office Board of Appeals failed to establish a prima facie case of obviousness with regard to claims one to three and five to seven of application serial No. 124,312 relating to a blood filter assembly. 35 U.S.C.A. § 103.

Patents \$\ightarrow 328(2)\$

291k328(2) Most Cited Cases

1,175,948. Cited as prior art.

*900 James W. Geriak, Los Angeles, Cal., argued for appellants. With him on brief was Bradford J. Duft, Los Angeles, Cal.

John F. Pitrelli, Arlington, Va., argued for appellee. With him on brief were Joseph F. Nakamura, Sol. and John W. Dewhirst, Associate Sol., Washington, D.C.

Before BENNETT, Circuit Judge, SKELTON, Senior Circuit Judge, and MILLER, Circuit Judge.

JACK R. MILLER, Circuit Judge.

This appeal is from the decision of the United States Patent and Trademark Office ("PTO") Board of Appeals ("board") affirming the examiner's rejection of appellants' claims <u>[FN1]</u> 1-3 and 5-7 as unpatentable under 35 U.S.C. § 103. We reverse.

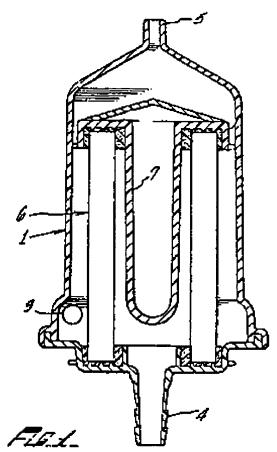
<u>FN1.</u> In application Serial No. 124,312, filed February 25, 1980, for a "Blood Filter."

THE INVENTION

Appellants claim a "blood filter assembly" used during surgery and other medical procedures involving the handling of blood to remove clots, bone debris, tissue, or other foreign materials from blood before it is returned to a patient's body. Unlike blood filter assemblies widely used in the prior art, the device of the present invention permits both entry of the blood into, and ultimate discharge of the blood out of, the *bottom* end of the filter assembly, as shown below. [FN2]

<u>FN2.</u> Extraneous numbers have been removed from this and the subsequent drawing for clarification.

*901



The blood filter assembly comprises a shell 1 provided with blood inlet 3 and blood outlet 4. Between the blood inlet and the blood outlet is filter medium 6 positioned within the filter medium core 7.

The location of blood inlet 3 is such that the incoming blood is directed along a spirally upward path by the inner wall of the shell. Further, the location of the blood inlet at the bottom end of the filter assembly facilitates the removal of gas bubbles by allowing them to rise upwardly out of the blood. The gas bubbles so removed are released from the blood filter assembly by means of a gas vent 5 located in the region of the top end of the assembly.

Independent claim 1, from which the other appealed claims depend, is illustrative:

Blood filter assembly comprising:

- a. a shell having a first top end and a second bottom end.
- b. a blood inlet located in the region of said bottom end and opening into said bottom end,
- c. a blood outlet located in the region of said bottom end,
- d. a gas vent located in the region of said top end, and

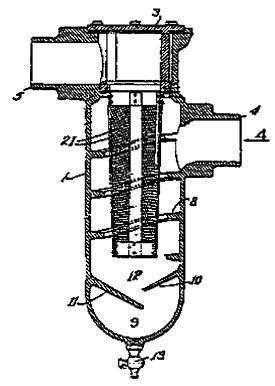
e. a blood filter medium located between said blood inlet and said blood outlet, said blood inlet being located and configured in a

manner capable of directing incoming blood in a generally spiral path within said shell.

Claims 2, 3, and 5-7 further define the shape of the shell, the shape of the filter medium, and the nature of the material used as the filter medium.

PRIOR ART

The sole reference relied upon by the board is United States Patent No. 1,175,948, issued March 21, 1916, to French. French discloses a liquid strainer for removing dirt and water from gasoline and other light oils. As shown below, the inlet 4 and outlet 5 of the French device are both at the *top* end of the device.



*902 A continuous helical tooth or thread 8 is formed integral with the inner wall of shell 1 and imparts to the incoming liquid a whirling motion, which gives the liquid a scouring action to help clean the surface of a metal screen filter 21 and guides unwanted dirt and water downwardly into a pocket 9 in the bottom of the shell. A pair of shelves 10 and 11, projecting inwardly and downwardly from the inner wall of the shell, further assists the entrance of dirt and water into the pocket 9 and prevents their being drawn back into the main chamber 12. The reference expressly

, 733 F.2d 900 733 F.2d 900, 221 U.S.P.Q. 1125 (Cite as: 733 F.2d 900)

states, "gravity assists in the separation of heavier oils or water." A pet-cock 13, projecting vertically downward from the bottom of the pocket is used to remove the collected dirt and water periodically. The top of the liquid strainer is completely closed by gland 3 except for the inlet and outlet openings.

BOARD OPINION

The board held that the appealed claims were drawn to an apparatus which "would have at least been rendered prima facie obvious to one of ordinary skill in the art by the apparatus disclosed in French." The board's reasoning was that it would have been obvious to turn the French device upside down to have both the inlet and outlet at the bottom, rather than at the top; and to employ French's "pet-cock" as the claimed "gas vent." In the board's opinion, no patentable distinction was created by viewing French's apparatus from one direction and the claimed apparatus from another.

ANALYSIS

We are persuaded that the board erred in its conclusion of prima facie obviousness. The question is not whether a patentable distinction is created by viewing a prior art apparatus from one direction and a claimed apparatus from another, but, rather, whether it would have been obvious from a fair reading of the prior art reference as a whole to turn the prior art apparatus upside down. French teaches a liquid strainer which relies, at least in part, upon the assistance of gravity to separate undesired dirt and water from gasoline and other light oils. Therefore, it is not seen that French would have provided any motivation to one of ordinary skill in the art to employ the French apparatus in an upside down orientation. The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability See Carl Schenck, A.G. v. of the modification. Nortron Corp., 713 F.2d 782, 787, 218 USPQ 698, 702 (Fed.Cir.1983), and *In re Sernaker*, 702 F.2d 989, 995-96, 217 USPQ 1, 6-7 (Fed.Cir.1983), both citing In re Imperato, 486 F.2d 585, 587, 179 USPQ 730, 732 (CCPA 1973).

Indeed, if the French apparatus were turned upside down, it would be rendered inoperable for its intended purpose. The gasoline to be filtered would be trapped in pocket 9, and the water French seeks to separate would flow freely out of the outlet 5. Further, unwanted dirt would build up in the space between the wall of shell 1 and screen 21, so that, in

time, screen 21 would become clogged unless a drain valve, such as pet-cock 13, were re-introduced at the new "bottom" of the apparatus. See <u>In re Schulpen</u>, 390 F.2d 1009, 1013, 157 USPQ 52, 55 (CCPA 1968). In effect, French teaches away from the board's proposed modification.

Because the PTO has failed to establish a *prima* facie case of obviousness, the rejection of claims 1-3 and 5-7 as unpatentable under 35 U.S.C. § 103 must be reversed. [FN3]

<u>FN3.</u> Because our holding that the PTO has failed to establish a *prima facie* case is dispositive, it is unnecessary to reach other arguments raised by appellants.

REVERSED.

733 F.2d 900, 221 U.S.P.Q. 1125

END OF DOCUMENT



270 F.2d 810

46 C.C.P.A. 976, 270 F.2d 810, 123 U.S.P.Q. 349 (Cite as: 46 C.C.P.A. 976, 270 F.2d 810)

United States Court of Customs and Patent Appeals.

Application of Ferdinand J. RATTI.

Patent Appeal No. 6452.

Sept. 30, 1959.

The Board of Appeals of the United States Patent Office affirmed rejection by Primary Examiner of claims 1, 4, 7 and 10 of application, Serial No. 359,325, for a patent for an oil seal for sealing the space between a bore in a housing and a relatively movable shaft centrally located in the bore, and the applicant appealed. The Court of Customs and Patent Appeals, Smith, Judge, reversed the rejections of claims 1, 4, 7 and 10.

Reversed.

Kirkpatrick, District Judge, and Worley, Chief Judge, dissented.

West Headnotes

Patents \$\infty 113(8)\$

291k113(8) Most Cited Cases

On appeal from decision of Board of Appeals of the United States Patent Office affirming rejection by Primary Examiner of certain claims of application for patent for an oil seal for sealing space between a bore in a housing and a relatively movable shaft centrally located in the bore, rejections of the claims were reversed by Court of Customs and Patent Appeals.

Patents \$\infty\$ 328

291k328 Most Cited Cases

1,546,942. Cust. & Pat.App. Cited.

**810 *977 Cromwell, Greist & Warden, Chicago, Ill. (Raymond L. Greist, Chicago, Ill., of counsel), for appellant.

Clarence W. Moore, Washington, D.C. (S. Wm. Cochran, Washington, D.C., of counsel), for Commissioner of Patents.

Before WORLEY, Chief Judge, RICH, MARTIN, and SMITH, Judges, and Judge WILLIAM H. KIRKPATRICK. [FN*]

FN* United States Senior District Judge for

the Eastern District of Pennsylvania, designated to participate in place of Judge O'Connell, pursuant to the provisions of <u>Title 28 United States Code, Section 294(d)</u>.

SMITH, Judge.

This is an appeal from the decision of the Board of Appeals of the United States Patent Office affirming the rejection by the Primary Examiner of claims 1, 4, 7 and 10 of appellant's application serial No. 359,325, filed June 3, 1953, for a patent on an 'Oil Seal' for sealing the space between a bore in a housing and a relatively movable shaft centrally located in the bore.

Claim 1 is representative of claims 4 and 7 and reads:

'1. A seal for insertion in a cylindrical bore in a housing about a relatively movable centrally located shaft, comprising an annular bore-engaging mounting portion of resiliently deformable material for endwise insertion in and statically sealed engagement with the bore in the housing, an annular shaft-engaging portion connected with said bore-engaging portion for running engagement with the shaft, and a metal ring located adjacent one end of said bore-engaging portion, said ring being provided with a plurality of axially extending outwardly biased spring fingers in outwardly clamped engagement with said boreengaging portion inwardly of the outer periphery of the latter, and said ring being also provided outwardly of said bore-engaging portion with means for detachably connecting the ring to the housing outwardly of the bore in the latter.' (Emphasis ours.)

*978 Claim 10 differs from the other claims on appeal and reads:

'10. A seal for insertion in a cylindrical bore in a housing about a relatively movable centrally located shaft, comprising a sealing ring having an outer bore-engaging portion of resiliently deformable material, which portion is of somewhat larger diameter than the bore in the housing, for press-fit insertion in the bore, and a metal retaining ring associated with the sealing ring, said retaining ring being connected with **811 the sealing ring and being provided outwardly of the latter with resiliently yieldable hook formations which are adapted to be sprung into interlocking engagement with a complementary

formation associated with the housing outwardly of the bore, which engagement acts to prevent axial displacement of the sealing ring relative to the bore in the housing.' (Emphasis ours.)

The references in the case are:

Roth	1,546,942	July	21,	1925.
Norton	1,951,034	Mar.	1,	1934.
Jepson	2,544,324	Mar.	6,	1951.
Chinnery et al. (British)	578 , 526	July	2,	1946.

Appellant's shaft seal comprises an annular sealing member of resilient deformable material which is adapted to be inserted into a cylindrical bore surrounding a relatively movable shaft. The inner portion of the sealing member is provided with a flexible lip which is held in engagement with the shaft by a garter spring. In the outer portion of the sealing member, an annular slot is provided which is concentric with and spaced from the outer periphery of the sealing member. This slot extends axially from the end of the member and provides a pocket in which the axially extending outwardly biased spring fingers of a metallic attaching ring are located. This construction permits the spring fingers to exert a force on the resilient material in the direction of the annular wall of the bore to provide and maintain a snug engagement between the outer surface of the resilient member and the inner surface of the bore. The metallic attaching ring is also provided with radially extending resilient hooks located outwardly of the bore engaging portion of the resilient member. The housing is provided with a complementary formation outwardly of the bore which is engaged by the resilient hooks to provide a snap-on connection between the bore and the seal.

The Roth and Norton patents were relied upon by the examiner in rejecting claim 10, and since both references were considered by the board, we have included them in our consideration of this case. Roth shows a gasket structure for steam train line hose couplings. Norton shows an adjustable repair clamp for bell and spigot joints in which there is provided a sheet metal bridge piece 'preferably of spring material.' The bridge piece is sprung into interlocking engagement with a structural portion of the clamp and exerts its *979 force on a resilient packing ring which, if desired, may be cemented to it.

The Chinnery et al. patent is the reference principally relied upon by the Patent Office. It shows a housing provided with a bore surrounding a centrally located shaft. A reinforced and 'stiffened'

sealing member formed of a material such as rubber, is press fitted into the space between the bore and the shaft. The sealing member has an inner lip held in contact with the shaft by a garter spring. The bore engaging portion of the sealing member is 'stiffened' by an axially extending cylindrical sheet metal casing which acts as a reinforcing member for a definite purpose which is described by Chinnery et al. as follows:

'Owing to the limited radial space within which the oil seal is to be accommodated, the holding portion of the oil seal cannot be stiffened by being massive. Consequently the holding portion of the present oil seal is stiffened in the known manner by a reinforcement, which may either encase of line, or alternatively constitute, such holding portion and therefore makes the press-fitting contact with the machine part stationary relatively thereto, or may be an internal reinforcement in the **812 sense that it does not make press-fitting contact with the machine part stationary relatively thereto.' (Emphasis ours.)

In Fig. 8 Chinnery et al. shows a radially extending flange at the outer edge of a reinforcing member of the internal reinforcement type which flange extends beyond the sealing member 'to such an extent as to serve as a means of attachment of the oil seal to the housing i, additional to the interference press fit of the holding portion a in the housing recess g.' The aforesaid flange is shown attached to the housing by screws or bolts.

The Jepson patent relates to a gasket for sealing the space between the upper and lower vessels of a vacuum-type coffee maker. The gasket is an annular rubber member attached to the lower part of the upper vessel and is designed to fit into the upper part of the lower one. Located in a groove in the gasket is a sleeve member provided with axially and downwardly extending spring fingers which are so biased radially as to urge the lower peripheral portion of the gasket outwardly, thus effecting a tight

engagement with the mouth of the lower vessel.

Claims 1, 4, and 7 stand rejected on Chinnery et al. in view of Jepson, on the ground that it would not require 'invention' to replace the cylindrical sheet metal reinforcing member, which is secured to the Chinnery et al. sealing member, by an annular set of outwardly biased spring fingers shown by Jepson.

The problems which were solved by appellant's invention existed in this art at the time of his invention despite the Chinnery et al. disclosures. It was appellant rather than Chinnery et al. who provided *980 the art with a shaft seal in which the resilient element of the seal could be readily inserted into a bore in the housing so that it could be removed from the bore and replaced by a new sealing element without mutilation of the sealing surface of the bore. This is particularly important, the specification points out, where the bore is formed in light metal alloys such as are used in aircraft engines and which are relatively soft and easily damaged. In appellant's oil seal, the resilient seal is so constructed that when mounted in the bore, it will establish and maintain a fluid tight relationship between the outer peripheral surface of the resilient seal member and the inside of the bore. Where either natural or synthetic rubber is used as the resilient sealing member in such seals, the rubber in time will take a set or lose its resiliency at least to the extent that the seals soon become ineffective to prevent leakage of oil. When subjected to mechanical pressures and heat, such a rubber sealing element loses its sealing effectiveness at an accelerated rate. The problems in the oil sealing art arising from such use of resilient sealing elements appear to have persisted because of the failure of the art to recognize these characteristics of the rubber sealing element and to so design the resilient element and the mounting therefor as to assure holding the outer circumference of the resilient sealing element in static oil-sealing contract with the inner circumference of the bore in which it is inserted.

Appellant's seal differs from the art of record in at least three respects:

- (1) The provision of the annular slot which extends axially inward from one end of the resilient sealing element. This feature is claimed as part of the combination set forth in claim 4.
- (2) The outwardly biased resilient spring means or fingers inserted in the resilient sealing element. These means are claimed as part of the combination of claims 1, 4 and 7.

(3) The 'snap-on' connector which holds the resilient sealing element and engages with a complementary formation associated with the housing outwardly of the bore. This feature is in the combination of claim 10

The patents cited by the examiner, either alone or in combination, do not disclose a resilient shaft sealing element having these features.

It is common knowledge that resilient deformable materials such as either natural or synthetic rubber are incompressible, **813 that is, while they may be deformed, this can occur only if the design and mounting of the part permits the resilient material to change its shape in response to the applied forces.

*981 The seal construction disclosed in Chinnery et al. is such that the 'interference press fit' which that patent calls for is alone relied on to keep the seal tight. There is nothing in the Chinnery et al. patent to show how the resilient sealing element is maintained in resilient contact with the bore otherwise than by the resiliency of the rubber. If and when that resiliency is lost, the sealing effect will be impaired.

Considering the incompressible nature of the rubber in the sealing element disclosed in Chinnery et al., its stiffening and reinforcement by the cylindrical sheet metal member, and its 'interference press fit' in the bore, it seems clear to us that the Chinnery et al. seal cannot function in the manner of appellant's seal. Now, as to the contention that Jepson would suggest inserting a set of spring fingers, the resilient element of Chinnery et al. is forced so tightly into the bore and is so 'stiffened' that the use of the resilient spring fingers of Jepson could not possibly increase the resilient deformation of the Chinnery et al. seal in the direction of the bore or increase the sealing engagement of the seal with the bore. The teaching of the Chinnery et al. patent points away from the addition of any spring element. On the other hand, we find nothing in the disclosure of Jepson's coffee maker gasket to suggest that any part of it has applicability to shaft seals. The two arts are at least somewhat remote from each other even if they both involve sealing.

We, therefore, find that Chinnery et al. did not teach the shaft sealing art how to solve the problems which existed in that art at the time of appellant's invention. We hold, further, that the combination of Jepson with Chinnery et al. is not a proper ground for rejection of the claims here on appeal. This suggested

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combination of references would require a substantial reconstruction and redesign of the elements shown in Chinnery et al. as well as a change in the basic principles under which the Chinnery et al. construction was designed to operate.

Once appellant had taught how this could be done, the redesign may, by hindsight, seem to be obvious to one having ordinary skills in the shaft sealing art. However, when viewed as of the time appellant's invention was made, and without the benefit of appellant's disclosure, we find nothing in the art of record which suggests appellant's novel oil seal as defined in claims 1, 4 and 7.

We shall now consider the rejection of claim 10, remarking first that it differs from claims 1, 4 and 7 in that it is directed to a combination of a housing bore, a resilient sealing ring and a metal retaining ring connected to the sealing ring, wherein the metal ring has resilient hooks which secure the seal in the bore. This claim is not limited to the outwardly biased spring fingers.

*982 The examiner rejected claim 10 on two grounds: (1) that substitution for the screw securing means of Chinnery et al. of a series of spring hooks such as disclosed by Norton would not involve patentable invention, and (2) unpatentability over Roth.

We shall first dispose of the second rejection. The board held that claim 10 is drawn to a combination of a sealing ring and a housing bore in which the sealing ring is detachably placed and that Roth discloses nothing of this nature. The board therefore reversed the rejection on Roth and consequently it is not before us.

As to the first rejection, the board recognized that it was on the ground of unpatentability 'over Chinnery et al. in view of Norton' and pointed out that the examiner could see nothing patentable in substituting spring hook attaching means shown in Norton for the screws of Chinnery et al. It then said:

'Appellant argues that the references fail to suggest or teach how the proposed (claimed) combination could be made and after a careful consideration of the references, we **814 have concluded that he is correct in this respect. We therefore concede that the claim * * * defines novelty over the disclosure of Fig. 8 of Chinnery et al. Novelty alone however, is no proper basis for the allowance of a claim.' (Emphasis ours.)

Although, in reaching this conclusion, the board made no reference to Norton, the context compels the conclusion that novelty was found notwithstanding the disclosure of Norton, taken together with Chinnery et al. We fully agree, of course, with the board's statement that novelty alone is not enough for patentability.

With the next statement of the board, in explanation of its affirmance of the rejection of claim 10, we do not agree. It reads:

'In order to properly define invention (meaning, of course, patentable invention), a claim should clearly define a structure which possesses some definite advantage over the prior art. As far as we can determine there is no better combination of housing and seal produced by using a series of snap fastener connections to connect the seal to the housing, as in appellant's structure, over using a series of bolts, as in the structure shown by Chinnery et al. Both act to merely detachably connect one element to another element and as far as we can find are merely equivalent connecting means especially in the absence of any unexpected result or advantage being obtained, by using one means in preference to the other, on which the record before us is entirely silent.' (Emphasis ours.)

If we may extract from the foregoing what we understand to be the essence of the board's position in the matter, it is that claim 10 is not patentable, though it defines a combination which is novel over the disclosures of the references, because the claimed combination has not been shown to be any better than, or to possess any advantage over, what was known to the art.

*983 As was pointed out in In re Stempel, Jr., 241 F.2d 755, 44 CCPA 820, an applicant is entitled to a patent, under the statutes, unless one of the prohibitory provisions of the statutes applies. The statutory requirements for patentability, broadly stated, are novelty, usefulness and unobviousness, as provided in 35 U.S.C. sections 101, 102, and 103. While it is true that proof that an invention is better or does possess advantages may be persuasive of the existence of any one or all of the foregoing three requirements, and hence be indicative of patentability, Congress has not seen fit to make such proof a prerequisite to patentability. [FN1]

FN1. A critical essay on the existing law has recently appeared under the title 'A

Proposal For: A Standard of Patentability; Consonant Statutory Changes; A Manual on Determination of Patentability,' by Malcolm F. Bailey, 41 J.P.O.S. 192-225, 231-257. It advocates, as we understand it, that the present law should be changed to set up as the test for patentability, in place of the requirement of section 103 that an invention be unobvious, a requirement that the invention involve progress, which the author finds in the constitutional provisions. Congress has not seen fit to include in the statutes, at any time during the past 169 years so far as we are aware, a requirement that each and every patentable invention shall involve 'progress' in this sense, i.e., that each new invention must also be shown to possess some definite advantage over the prior art. The author relates the term 'progress' to individual inventions and then gives it the connotation that each such invention should be a technical advance, improvement or betterment. The verv making of the suggestion to change the law is an indication that the existing law is otherwise.

Appellant's invention, as defined in claim 10, has been held by the board to possess novelty over the disclosure of Chinnery et al. Just what the board thought about the pertinency of Norton is obscure but it seems to have regarded this reference as of little moment. Appellant in his brief here said that Norton was held by the board to have no bearing on the invention and the Patent Office brief said that the appellant was correct **815 in so stating and that the court need not consider it. We are, therefore, virtually without any reference against claim 10 except Chinnery et al. and the rejection thereon is predicated solely on a theory of patentability we find to be outside of the patent statutes, namely, that the combination of claim 10 is, by reason of the use of spring retaining hooks instead of a series of bolts, no better than the combination of Chinnery et al. However intriguing such a ground of rejection may be, it is the duty of the tribunals of the Patent Office and of this court to apply the law as Congress has written it. While the provisions of the former R.S. 4893 may be said to have given the Commissioner some discretion in refusing to grant a patent on an otherwise patentable invention unless 'the same in sufficiently useful and important,' when the Patent Codification Act of 1952 was enacted, Congress removed this provision from old section 36 of title 35, now section 131. We take this as a further

indication that it is the intent of Congress that patentability be determined solely *984 by the provisions of sections 101, 102 and 103. We therefore reverse the board on this ground of rejection of claim 10.

If the issue before us were whether or not the spring hooks are better than the Chinnery et al. bolts-- and we consider this in the event we have misapprehended the position of the board-- we would hold that they are, on the basis of what is disclosed in the application. This retaining means seems to possess many advantages over screws. Similarly, if the board was intending to say that the hooks and the bolts are merely equivalent connecting means and that claim 10 is unpatentable because its combination differs from the prior art only in the substitution of an equivalent for one element in an old combination, then we would also have to disagree since we think it is clear that the use of the spring hooks produces a result quite different from the bolts of Chinnery et al. On the record before us no reference relied on shows any spring hooks nor does it contain any support for the contention that bolts and spring hooks are equivalents.

For the foregoing reasons we reverse the rejection of claim 10.

The rejections of claims 1, 4, 7 and 10 are reversed.

*977 Reversed.

*984 MARTIN, Judge, concurs in result.

KIRKPATRICK, District Judge, dissenting, in which WORLEY, Chief Judge, joins.

I think that the board's rejection of claims 1, 4, and 7 should be affirmed. The central idea and the most important feature of these three claims, as well as of allowed claim 5, is the exertion of outwardly directed pressure upon the bore engaging portion of the sealing member, the result accomplished being to counteract the tendency of rubber to 'set' or lose its resiliency and so become ineffective to prevent leakage. Jepson comes very close to completely anticipating this feature of the patent. All that would be necessary to make the anticipation complete would be to provide the Jepson seal with a shaft engaging portion and, incidentally, claim 7 does not specify any shaft engaging portion.

Of course, it was necessary that the seal be attached to the bore in a manner to prevent its displacement.

Chinnery provides a flange and screws for this purpose and none of the three claims referred to calls for anything more specific than 'means.' Thus it seems clear that claims 1, 4, and 7 show no patentable novelty as against the prior art of Chinnery plus Jepson.

The only question is whether Jepson is in a nonanalogous art sufficiently remote from that of the application to put it beyond the probability that it would be considered by persons skilled in the art *985 endeavoring to solve the problem to the solution of which the application is directed. I do not think that it is. Jepson was trying to meet exactly the same problem as the application under consideration, namely, to provide a compressible **816 seal which could be readily detached or inserted in a cylindrical bore but which would maintain a firm and leakproof seat on the bore when in place. I agree with the Solicitor's argument that one seeking to improve a machinery seal would reasonably be expected to investigate not only machinery seals but seals in other arts where similar problems would be encountered. See In re O'Connor, 161 F.2d 221, 34 CCPA 1055.

Claim 10 stands on a somewhat different basis. This claim entirely omits what I think, and have stated above, to be the heart of the application. In substance, claim 10 really amounts to no more than a claim for a hook formation to interlock with the housing of a bore in order to hold a press fit seal in place. [FN1] Chinnery discloses means to serve the same purpose consisting of screws.

FN1. Chinnery discloses a press fit seal, but no one has suggested that there is anything new about such a device and the specification of the application before us concedes that it is old in the art.

The board conceded that the combination disclosed in claim 10, consisting of spring hooks to fasten a press fit seal to the bore, disclosed novelty over Chinnery but not patentable novelty.

I do not read the opinion of the board as predicating its conclusion of want of invention on the theory that in order to be patentable a combination must have some distinct advantage over the prior art. The board stated that there was nothing in the record to show that the substitution of hooks for screws produced any unexpected result or advantage and, therefore, concluded that the introduction of hooks did not create patentable novelty, but was a mere substitution

of equivalents. The statement that the spring hooks of Ratti were no better than the screws of Chinnery was directed toward this point and seemingly was added to fortify the board's finding of equivalency rather than to propound a theory of patentability. I agree with the board that this claim, though it may show novelty over Chinnery, does not show patentable novelty, and I would affirm its rejection.

46 C.C.P.A. 976, 270 F.2d 810, 123 U.S.P.Q. 349

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United States Court of Customs and Patent Appeals.

In re John W. KELLER, Jr., Reese S. Terry, Jr., and Gomer L. Davies.

Appeal No. 80-573.

Feb. 12, 1981.

Applicant appealed from decision of Patent and Trademark Office Board of Appeals in reissue application serial No. 865,610 for cardiac pacer having a digital counter, rejecting all claims in application. The United States Court of Customs and Patent Appeals, Nies, J., held that: (1) Board's determination that claims in application for reissuance of Patent No. 3,557,796 for cardiac pacer having digital counter were unpatentable in view of prior art was supported by sufficient evidence; (2) declaration made to support application requesting reissuance of patent failed to properly incorporate by reference citation of prior art; and (3) passage in declaration fairly complied with requirement that applicant specify "the errors or what might be deemed to be errors relied upon, and how they arose or occurred" and requirement that applicant state that said errors, if any, arose without deceptive intention on part of applicant.

Modified.

West Headnotes

11 Patents 328(2) 291k328(2) Most Cited Cases

(Formerly 291k328(4))

3,557,796. Taken collectively, reference teachings of patent for transistorized, implantable cardiac pacer for regulating animal heart, patent for nonimplantable cardiac pacer for regulating a heart and patent for heart stimulater used in studies of atrioventricular conduction system of mammalian heart established prima facie case of obviousness of Patent No. 3,557,796 for cardiac pacer having digital counter, and obviousness of patent was unrebutted by affidavit of expert in cardiac pacer art, which only attacked third reference, and thus sufficient evidence supported decision of Patent and Trademark Office Board of Appeals rejecting claims in application requesting reissuance of patent. 35 U.S.C.A. § 103.

[2] Patents \$\infty\$ 141(1)

291k141(1) Most Cited Cases

To justify combining reference teachings in support of rejection of claims in application requesting reissuance of patent, it is not necessary that device shown in one reference can be physically inserted into device shown in the other. 35 U.S.C.A. § 103.

[3] Patents @ 16(3)

291k16(3) Most Cited Cases

(Formerly 291k18)

Test for obviousness of patent is not whether features of secondary reference may be bodily incorporated into structure of primary reference; nor is it that claimed invention must be expressly suggested in one or all of the references; rather, test is what combined teachings of references would have suggested to those of ordinary skill in the art. 35 U.S.C.A. § 103.

[4] Patents \$\insigma_{140}\$

291k140 Most Cited Cases

Declaration made to support application requesting reissuance of patent failed to properly incorporate by reference citation of prior art, where citation was not subscribed by applicant and did not include personal declaration of applicant. Patent Office Practice Rule 175(a), 35 U.S.C.A. App.

[5] Patents \$\inspec\$140

291k140 Most Cited Cases

Passage in declaration in support of application requesting reissuance of patent fairly complied with requirement that applicant specify "the errors or what might be deemed to be errors relied upon, and how they arose or occurred" and requirement that applicant state that said errors, if any, arose without deceptive intention on part of applicant, where passage was remarkably close to what subsequently appeared in manual of patent examining procedure with respect to content of declaration for that purpose. Patent Office Practice Rules 175(a)(5, 6), 35 U.S.C.A. App.

Patents \$\infty 328(2)\$

291k328(2) Most Cited Cases

3,557,796. Cited.

*414 Henry D. Pahl, Jr., Boston, Mass., Gilbert H. Hennessey, Washington, D. C., for appellants.

Joseph F. Nakamura, Sol., Patent & Trademark Office, Thomas E. Lynch, Washington, D. C., of counsel.

Before MARKEY, Chief Judge, and RICH,

BALDWIN, MILLER, and NIES, Judges.

NIES, Judge.

This appeal is from the decision of the Patent and Trademark Office (PTO) Board of Appeals (board) in reissue application serial No. 865,610, filed December 29, 1977,[FN1] *415 for "Digital Counter Driven Pacer." Claims 1, 2, 6, 7, and 9-16 (all of the claims in the application) stand rejected on the ground of a defective reissue declaration, and claims 1, 2, 6, 7, 9-11, 13, and 14 are rejected on the ground of obviousness in view of the following references:

<u>FN1.</u> The application requests reissuance of U.S. Patent No. 3,557,796 issued January 26, 1971, on application serial No. 805,714, filed March 10, 1969, by Cordis Corporation, the assignee. Protests were

filed against the reissue application by Cardiac Pacemakers, Inc. (CPI) and by Norman H. Stepno of the firm of Bacon & Thomas pursuant to the provisions of 37 CFR 1.291. A brief amicus curiae for protestor CPI was filed in this appeal. Two cases have been filed in the United States District Courts involving appellant's '796 patent:

- (1) Cordis Corp. v. Cardiac Pacemakers, Inc. and Edward J. Luczek, United States District Court, District of Massachusetts, Civil Action No. 77-3044- F (infringement action); and
- (2) Cardiac Pacemakers, Inc. v. Cordis Corp., United States District Court, District of Minnesota, Fourth Division, Civil Action No. 4-77-427 (declaratory judgment action).

Inventor	U.S. Patent No.	Issue Date
Keller. Jr. (Keller)	3,253,596	May 31, 1966
Berkovits	3,345,990	Oct. 10, 1967

Walsh and Moore (Walsh), The American Journal of Medical Electronics, First Quarter, 1966, pages 29-34.

Claim 12 is allowable over the art of record but is objected to on the ground that the claim depends from a rejected claim. Claims 15 and 16 are allowable over the art of record. [FN2] We affirm in part and reverse in part.

FN2. In addition to Keller, Berkovits, and Walsh, numerous other references were before the examiner. The examiner indicated in an Office Action dated May 8, 1978, however, that these other references were not any more pertinent than Keller, Berkovits, and Walsh.

Claims 1, 2, 6, 7, and 9-16 [FN3] are rejected under 35 U.S.C. s 251 on the ground that the declaration made by applicant to support the reissue application does not particularly specify the prior art being brought to the attention of the examiner as required by 37 CFR 1.175(a)(4), does not particularly specify the errors relied upon by applicant and how the errors arose as required by 37 CFR 1.175(a)(5), and does

not state that the errors arose "without any deceptive intention" on the part of applicant as required by <u>37</u> <u>CFR 1.175(a)(6).[FN4]</u>

FN3. Claims 1-12 were included in the reissue application as filed. By preliminary amendment claim 1 was amended and new claims 13 and 14 added. By subsequent amendment claims 3, 4, 5, and 8 were cancelled and new claims 15 and 16 added, the latter two claims reciting in independent form the same subject matter of cancelled dependent claims 5 and 8, respectively. Claims 9-12 were not amended during prosecution of the reissue application.

FN4. 37 CFR 1.175 (1980) reads, in pertinent part:

- s 1.175 Reissue oath or declaration.
- (a) Applicants for reissue, in addition to complying with the requirements of the first sentence of s 1.65, must also file with their applications a statement under oath or declaration as follows:
- (4) When the applicant is aware of prior art or other information relevant to

patentability, not previously considered by the Office, which might cause the examiner to deem the original patent wholly or partly inoperative or invalid, particularly specifying such prior art or other

information and requesting that if the examiner so deems, the applicant be permitted to amend the patent and be granted a reissue patent.

(5) Particularly specifying the errors or what might be deemed to be errors relied upon, and how they arose or occurred.

(6) Stating that said errors, if any, arose "without any deceptive intention" on the part of the applicant.

(24 FR 10332, Dec. 22, 1959, as amended at 29 FR 18503, Dec. 29, 1964; 34 FR 18857, Nov. 26, 1969; 42 FR 5594, Jan. 28, 1977)

Claims 1, 2, 6, 7, 9, 10, 11, 13, and 14 are rejected as unpatentable in view of Keller taken with Walsh. Claims 1 and 2 are further rejected as unpatentable in view of Berkovits taken with Walsh. The statutory basis of these rejections is 35 U.S.C. s 103.

The Invention

The claimed invention is a cardiac pacer having a digital counter.

As background, the specification explains:

In the normal heart, electrical signals are generated and appear in the atrium at a rate of approximately 60 to 120 times per minute, depending on such factors as body size and amount of physical exertion. Approximately 0.1 second after such a signal has appeared in the atrium, *416 it is transferred to the ventricle of the heart, which reacts to the stimulation by contracting. This contraction forces blood from the ventricle into the arterial system and thence to the entire body. The delay between the appearance of an electrical signal in the atrium and its appearance in the ventricle is called the A-V delay. Following the contraction of the ventricle, there is an insensitive period lasting about 0.4 second, during which time the heart is unresponsive to electrical pulses. This time is referred to as the refractory delay period.

A common type of heart failure is irregularity in the generation of atrial potentials. In some cases, these potentials appear at only a low rate; in others, they cease entirely for extended periods though at other times the signals may be generated with perfect regularity. It is in persons suffering from this kind of cardiac disorder that a standby or so-called demand mode pacer is used. This device is

designed to apply stimulating pulses to the ventricle, by means of an electrode implanted therein, only when the heart fails to generate pulses When natural pulses regularly spontaneously. appear, the pacer provides no stimulation; when they appear irregularly, the pacer adjusts its timing to integrate its artificial pulses with the natural ones. This type of pacer is often provided with circuitry which stimulates the refractory delay period of the heart. The reason for including such delay circuitry is that a spontaneous electrical signal which appears a short time after delivery of an artificial pulse is ineffective to pump blood, either because the natural refractory period of the heart caused the heart to ignore the spontaneous pulse or because the ventricle has not had time following the previous beat to be refilled with blood. A simulated refractory period causes the pacer likewise to ignore these ineffective beats. The device's timing continues just as if the beats had never occurred.

Another form of heart disease is the so-called A-V block in which the patient's heart undergoes normal or near-normal atrial contraction but the atrial signal is not transferred to the ventricle. With such a patient, it is desirable to use a so-called synchronous pacer which detects atrial signals and supplies to the ventricle a stimulating pulse about 0.1 second later, a period which constitutes a simulated A-V delay. In the absence of detected atrial signals, the pacer supplies ventricular pulses at a fixed rate. The synchronous pacer, like the demand pacer, is often provided with refractory delay simulation.

Summarizing the invention, the specification states:

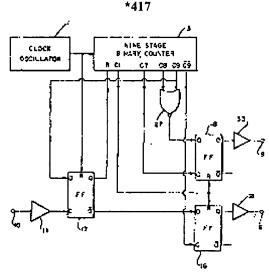
(A) cardiac pacer according to the present invention times various events and delays by means of a digital counter which is driven by an oscillator operating at a frequency which is a relatively large multiple of a normal heartbeat rate. A cardiac stimulating pulse is generated at a predetermined point in the count. Thus, if the counter cycles repetitively, the heart is stimulated at a predetermined fixed rate. To provide demand mode operation, the counter is reset in response to spontaneous cardiac signals thereby to prevent stimulation when the heart is functioning normally. To provide synchronous mode operation, the counter is reset to a point preceding the stimulation count by an amount which simulates a normal A-V delay.

The use of digital count down circuitry permits both the various delays and the durations of the stimulating pulses to be accurately timed. Further,

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by counting down from a relatively high frequency, an oscillator having a relatively short duty cycle may be used so as to reduce battery drain. Further, the use of a relatively short oscillator period permits timing components, e. g., capacitors, of relatively small size to be used.

A block diagram of a cardiac pacer, according to the present invention, appears below:



[FF indicates D-TYPE FLIP-FLOP]

The specification indicates that if the pacer is to operate in the demand mode in a particular patient, an output electrode implanted in the patient's heart at a location suitable for stimulating ventricular contractions is connected to output terminal 6 of the pacer. If the pacer is to operate in the synchronous mode in a particular patient, an output electrode implanted in the patient's heart at a location suitable for stimulating ventricular contractions is connected to output terminal 9 of the pacer.

According to the specification, for demand mode operation an input electrode implanted to detect ventricular signals of the patient's heart is connected to input terminal 10 of the pacer. For synchronous mode operation, an input electrode implanted to detect atrium signals of the patient's heart is connected to the input terminal 10. "Cardiac signals applied to the input terminal 10 are amplified and shaped by means of an amplifier 11 so as to be squared into waveforms suitable for use with digital circuitry, as is understood by those skilled in the art."

The timing of the different events occurring in the operation of appellant's pacer is provided by a digital

counter 3.

The counter is driven by an oscillator 1 which establishes the time base. As illustrated, counter 3 comprises a nine stage binary divider and the oscillator 1 runs at a frequency which is relatively high with respect to the contemplated range of heartbeat rates or frequencies....

As is conventional, counter 3 provides a two-stage output signal for each stage of binary division

As is also conventional, the counter 3 runs cyclically, that is, the states of the binary output signals pass through a sequence which repeats after all the possible combinations have been utilized.... Further, the counter may at will be reset to a predetermined starting point by the application of a reset signal to a reset terminal, designated R. The starting point of the counter is considered herein to be the zero count and the various possible states or counts are considered to be zero through 511.[FN5]

FN5. Consequently, the counter counts as follows: 0, 1, 2, 3, ..., 509, 510, 511, 0, 1, 2, ..., that is, the count changes from "511" to "0"

In describing operation of the pacer in the demand mode, the specification states that:

... if the patient's heart is beating normally at a rate which is more than the free running rate of the pacer, i. e. about 70 beats per minute, and not more than twice that rate, i. e. about 140 beats per minute, the counter 3 will be reset to its zero count by each natural heartbeat before a count of 511 is reached. Thus, the patient's heart will not be stimulated at all if it is beating spontaneously within this 2-to-1 range of rates. However, if no spontaneous heartbeat is detected between count 256 and count 511, the pacer will then stimulate the patient's heart at the end of the full count period, that is, after a period which corresponds to the 70 pulse per second free running rate. In other words, the difference between the starting point count and the end of the counting sequence maximum interval establishes a heartbeats. Accordingly, if the spontaneous heart signals disappear intermittently, the pacer *418 will integrate its operation with the normal heartbeat.

In describing operation of the pacer in the synchronous mode, the specification states:

The resetting of counter 3 is controlled in response to detected signals as described previously. Thus, the counter is reset to its zero count if an atrial signal is detected from count 256 through count

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511. A stimulating pulse is then generated at output terminal 9 when count 64 is reached. The delay provided by the interval between the resetting and the 64 count is about 108 milliseconds which satisfactorily simulates the normal A-V delay. Thus the heart is stimulated with timing appropriate for synchronous pacer operation.

If no atrial signals at all are detected, the counter 3 will run cyclically as described previously and stimulating pulses will be generated at a fixed rate, one pulse being generated each time the counter 3 passes the 64 count.

The specification describes the digital timing circuit in more detail than set forth above. The claims rejected on prior art, however, do not recite such detail. Claims 1 and 13 are illustrative:

1. Cardiac pacer apparatus comprising:

an oscillator providing a pulsating signal at a preselected frequency, which preselected frequency is a relatively large multiple of a normal heart beat rate:

a cyclically operating digital counter means for counting the pulsations of said pulsating signal; means controlled by said counter for generating a cardiac stimulating potential when said counter reaches a predetermined count;

means for detecting a naturally occurring heart

means for setting said counter to a preselected value when a naturally occurring heart beat is detected. (Paragraphing added.)

13. Cardiac pacer apparatus comprising:

an oscillator providing a pulsating signal at a preselected frequency, which preselected frequency is a relatively large multiple of a normal heart beat rate;

a cyclically operating digital counter means for counting the pulsations of said pulsating signal; means controlled by said counter for generating a

means controlled by said counter for generating a cardiac stimulating potential when said counter reaches a predetermined count;

means for detecting cardiac signals generated during a heart beat; and

means responsive to such detected cardiac signals for setting said counter to a starting point count which precedes said predetermined count by a number corresponding to a preselected maximum interval between successive heartbeats whereby a stimulating potential is generated only if said preselected maximum interval elapses between heart beats. (Paragraphing added.)

The References The Keller '596 Patent

Keller relates to a transistorized, implantable cardiac pacer for regulating an animal heart. The specification states that a pacer according to the Keller invention includes:

... sensing means responsive to a physiological heart pacing signal for producing a trigger signal, means for delaying said trigger signal for a period substantially equal to a normal atrial-ventricular delay,[FN6] a two-state free running oscillator one state of which can be terminated by the arrival of a delayed trigger signal and the other state of which is unaffected by the arrival of a signal, means responsive to the return of said oscillator to said one state for producing ventricular stimulation, whereby the minimum rate at which the pacer operates is determined by the *419 natural period of the oscillator and the maximum rate at which said pacer can operate is determined by the natural duration of said other state, the natural durations of each of said states being independently predeterminable, and the arrival of delayed trigger signals at frequencies between said minimum and maximum synchronously controls said oscillator.

> <u>FN6.</u> According to Keller, the atrialventricular (A-V) delay is approximately two-tenths of a second in man, and less in smaller animals.

Identifying the elements described in the Keller patent, the examiner found the Keller pacer includes:

a pulse generator (comprising blocking oscillator 40, stimulating pulse generator 50, and output amplifier 60);

an analog time base circuit included in the pulse generator for generating a cardiac stimulating potential at a predetermined time (comprising transistors T5, T6);

means for detecting cardiac signals (comprising amplifying circuit 10,20);

reset means for setting the analog time base circuit to a starting point (comprising diode D2); and

means for inhibiting the resetting during a preselected refractory delay period which ends at a time after the starting time but before the stimulus generating time (comprising delay circuit 30).

Appellant has not disputed these findings.

The Keller pacer can operate in a synchronous mode and in an asynchronous free-running mode. In the

synchronous mode, an atrial signal is sensed, amplified, and processed, and a ventricular stimulation pulse produced and applied to the heart a predetermined time after the occurrence of the atrial signal. This predetermined time corresponds approximately to the normal A-V delay. If atrial signals are sensed to occur at a dangerously high rate, the pacer operates in the synchronous mode to produce and apply ventricular stimulation pulses at a predetermined maximum rate. If atrial signals are not sensed or are too weak for synchronization purposes, the pacer operates in the asynchronous free-running

mode to produce and apply ventricular stimulation

pulses at a predetermined minimum rate.[FN7]

<u>FN7.</u> The minimum rate is 60 pulses per minute for a human patient.

Both the sensing of the atrial signal and the application of ventricular stimulation are accomplished by electrodes implanted in the patient's heart.

The Berkovits '990 Patent

Berkovits relates to a cardiac pacer for regulating a heart. The specification states that a pacer according to the Berkovits invention includes: means for accurately monitoring the beating action of a human heart; means for providing corrective electrical stimulation of the beating action of an abnormal heart; and means for automatically effecting such corrective heart stimulation only where required as determined by the means for monitoring the heart. The Berkovits pacer functions to "furnish stimulation to an abnormal heart in such a manner that heartbeats are individually stimulated and closely integrated with natural heartbeats."

Identifying the elements described in the Berkovits patent, the examiner found the Berkovits pacer includes:

an analog time-base pulse generator (comprising heart stimulating means 12 and pulse generating means 18);

means for detecting a naturally occurring heartbeat (comprising detecting means 14 and amplifying means 16); and

means for restarting the timing period when a naturally occurring heartbeat is detected (comprising triode clipper 122).

Appellant has not disputed these findings.

The Berkovits pacer is not implantable. The

monitoring means 10 includes electrocardiograph means 14 for detecting electrical signals developed by the heart during natural heartbeat action, vacuum tube amplifier means 16 for amplifying these natural heart signals, vacuum tube pulse generating means 18 responsive to the amplified signals for sending control signals to vacuum tube heart stimulating means 12, and may also include oscilloscope means 20 and audible signal means 22 for providing visual *420 and audible indications of the occurrence of natural and stimulated heartbeats.

The heart stimulator 12 is equipped with a doublepole triple-throw switch 177 which permits manual selection of the mode of operation of the heart stimulator. Berkovitz states:

When the movable switch arms 178,180 (of switch 177) are set on the fixed contacts 182,184, respectively, the heart stimulator will not be operative.... (W)hen the movable arms are set on the fixed contacts 186,188, the heart stimulator is adapted to provide a continuous series of heart stimulating electrical impulses at a predetermined rate which is independent of natural heartbeats occurring at the same time.... (W)hen the movable arms are set on the fixed contacts 190,192 ... the heart stimulator is adapted to provide heartstimulating electrical impulses only in closely integrated relation to natural heartbeats ... so that stimulated and natural heartbeats can each contribute to maintenance of a predetermined heartbeat rate.

Electrodes 218 of any conventional type ... can be employed for applying a relatively large heart stimulating pulse to the patient's heart from outside the patient's body whereas the electrodes 220 can be surgically connected to the patient's heart for applying a relatively smaller electrical impulse directly to the patient's heart when desired.

Variable resistor 210 of the heart stimulating means 12 is used to selectively vary the amplitude of the heart stimulating pulse to be applied to the heart through electrodes 218 and 220.

We note that, in addition to the mode selection switch 177 and the stimulating pulse amplitude adjustment control 210 included in the heart stimulating means 12, the amplifier means 16 includes a polarity-reversing switch 32, a bias circuit switch 62, a variable voltage divider 116 which serves as a center control for the oscilloscope means 20, and a variable voltage divider 106,108 which serves as an amplifier gain control. It is apparent from the Berkovits disclosure as a whole that these

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switches and variable circuit elements are operator controlled.

The Walsh and Moore Article

Walsh relates to a stimulator driving unit for the controlled stimulation of the heart of a mammal. The disclosed driver includes a digital timing circuit. Walsh states:

A digital timing system was used since it provides a higher degree of accuracy and resetability than the R-C type circuits used in conventional stimulators. In this system, a crystal-controlled, time-base generator provides a standard from which to derive the various intervals. A crystal frequency (of 0.1 megahertz) was chosen to provide a 10-u sec time base. The output of this circuit was amplified, shaped and fed to a series of six digital counting modules that make up the timing chain controlling intervals between stimuli.

The examiner found that Walsh discloses:

... the conventional expedient of providing a digital time base means for a medical stimulator by employing an oscillator having a frequency much higher, such (as) a relatively large multiple of the stimulation pulse frequency and counting means to produce a stimulating pulse at the desired frequency.

Appellant has not disputed these findings.

The Rejections Reissue Declaration Rejections

The examiner rejected claims 1, 2, 6, 7, 13-16 (the claims that were either amended or added during prosecution of the reissue application) under 35 U.S.C. s 251 as based on an insufficient reissue declaration. The declaration which accompanied the reissue application reads, in pertinent part:

- I, William P. Murphy, Jr., Chairman of the Board of Directors of Cordis Corporation, declare
- (1.) that subsequent to the issuance of U.S. Letters Patent No. 3,557,796, applicant *421 has, in connection with the prosecution of corresponding foreign patent applications, been made aware of prior art relevant to patentability not previously considered by the Patent Office, which prior art might cause the Examiner to deem the original patent wholly or partly inoperative or invalid;
- (2.) that this new prior art is particularly specified in a citation of prior art accompanying this reissue application;
- (3.) that, to the extent the (preliminary) amendment

(filed herewith) might be deemed to correct errors in the original patent, such errors arose without any deceptive intent or purpose upon the part of applicant; ...

/s/ William P. Murphy, Jr.

Date: Dec. 24, 1977

The "citation of prior art" referred to in the declaration and filed with the declaration reads, in pertinent part:

The following prior art has become known to applicant subsequent to the issuance of the original Letters Patent No. 3,557,796 and is being brought to the attention of the Patent and Trademark Office for its consideration in connection with this reissue application.

The references are: Copies are enclosed. /s/ (Attorney for Applicant) December 23, 1977

In making these rejections, the examiner stated that "applicants (sic) have not particularly specified all the changes in the claims (as set forth in the preliminary amendment) as the errors nor have they stated how they (the errors) arose or occurred."

The board affirmed the examiner and stated that the declaration fails to particularly specify the newly discovered prior art. Reference to another paper to be filed in the application is inadequate to fulfill this requirement.

The board further indicated that the declaration not only failed to comply with 37 CFR 1.175(a)(4), but also failed to comply with 37 CFR 1.175(a)(5) and (a) (6).[FN8] Accordingly, pursuant to 37 CFR 1.196(b), [FN9] the board rejected claims 9-12 (the claims that were neither amended nor added during prosecution of the reissue application) under 35 U.S.C. s 251 as based on a declaration which does not comply with 37 CFR 1.175(a)(4), (a)(5), and (a)(6).

FN8. See note 4, supra.

<u>FN9.</u> <u>37 CFR 1.196 (1980)</u> reads, in pertinent part:

s 1.196 Decision by the Board of Appeals.

(b) Should the Board of Appeals have knowledge of any grounds not involved in the appeal for rejecting any appealed claim, it may include in its decision a statement to that effect with its reasons for so holding, which statement shall constitute a rejection

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of the claims. (24 FR 10332, Dec. 22, 1959, as amended at 42 FR 5595, Jan. 28, 1977)

Prior Art Rejections

The examiner rejected claims 1, 2, 6, 7, 9-11, 13, and 14 as obvious in view of Keller taken with Walsh. He stated:

The claims define over the Keller, Jr. patent in the recitation of a digital time base pulse generator. Walsh et al discloses in Figure 3 the conventional expedient of providing a digital time base means for a medical stimulator by employing an oscillator having a frequency much higher, such as a relatively large multiple of the stimulation pulse frequency and counting means to produce a stimulating pulse at the desired frequency.

Providing an oscillator and counter-type digital time base generator for its analog equivalent in the Keller, Jr. et al device amounts to an obvious substitution to one of ordinary skill in the art after consideration of the prior art taken as a whole.

*422 The examiner further rejected claims 1 and 2 as obvious in view of Berkovits taken with Walsh. He stated that it would have been obvious in view of the teachings of Walsh to employ digital timing circuitry with a relatively high frequency oscillator in the Berkovits pacer in place of the analog timing circuitry.

Neither Keller nor Berkovits nor Walsh were cited during prosecution of the original patent application.

Rebuttal Evidence

To rebut the prima facie case of obviousness established by the examiner, appellant filed an affidavit of Jozef K. Cywinski, Ph.D. This affidavit, according to appellant, "concerns itself mainly with the question of whether the Walsh et al article suggest (sic) the use of digital timing in a cardiac pacer"

Dr. Cywinski, an expert in the cardiac pacer art, states in his affidavit:

In 1967 ... I met Neil Moore (co-author of Walsh) and learned of a digital timing unit which he and Leon Walsh had built and were using for their stimulation studies.... I have been shown a 1966 article (Walsh).... I recognized the apparatus referenced therein as being that which was described to me (by Moore) in 1967 or 1968. At this time (1967-1968), I was also aware of other medical research devices employing digital

counters as timing chains.

Even before this period, it was becoming increasingly common to employ digital timing techniques in research environments. The digital approach was indicated where precise incremental timing was needed or where considerable flexibility and repeatable adjustments were needed. These characteristics are typically needed in investigatory or research projects.

Of the various prior art laboratory timing devices employing digital counting chains, it should also be noted that these were largely operator-controlled devices....

Although I was thus quite familiar with the use of digital timing devices as laboratory instruments, I was nonetheless impressed with the novelty of the digital cardiac pacer, being developed by Cordis, which was first described to me by John Walter Keller in about 1970 in a form of a personal communication. This pacer is described and claimed in U.S. Patent No. 3,557,796. At the time, I did not regard the approach described to me by Keller as being obvious. Rather, I believed that the approach would not have been obvious even to try since the complexity would seem to outweigh the advantages of digital timing. Further, the usual advantages, i. e., exceptional precision and incremental adjustability, were not ones which would appear to have particular utility in cardiac pacers. Rather, the simplicity of the usual analog timing circuit would seem to offer the clear advantages. I should note that I was, at that time, also familiar with the Cordis synchronous pacer which is disclosed and claimed in Keller Patent No. 3,253,596 and also the American Optical standby pacer, an earlier version of which is disclosed and claimed in Berkovits Patent No. 3,345,990.

The Cordis pacer is a therapeutic device rather than a research tool and, further, is interactive with the spontaneous action of the patient's heart. The device disclosed in the Moore et al article does not in any similar way respond to naturally occurring heart signals nor am I aware of any other prior art device in which a digital counting chain is preset in response to a naturally occurring heartbeat. * * * The heart being stimulated (in Walsh) is an object of study, not an organism being aided in its natural function. * * *

I do not find in the Walsh et al article any suggestion that these attributes (higher degree of accuracy and resentability when digital timing circuitry is used instead of analog timing circuitry) *423 would be advantageous in a cardiac pacer.

A cardiac pacer is implanted in the human body to monitor and control ... the heart ... to continue the

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life of the patient ... with no wire connections to the world outside the patient's body.

(O)ne skilled in the art at the time of the Keller et al invention would not expect that it would be either desirable or advantageous to use complicated digital circuitry. Nor would one appreciate the great advantage of the digital approach, an approach which in practice has now become recognized by the industry. (Emphasis added.)

No other rebuttal evidence was offered. The examiner did not present any additional evidence in response to the affidavit.

Board Opinion

The board unanimously affirmed the rejection of claims 1, 2, 6, 7, and 13-16 under 35 U.S.C. s 251, and entered the rejection of claims 9-12 on the same ground.

The board was divided regarding the art rejections. Two members found the affidavit insufficient to overcome the prima facie case of obviousness established by the examiner and affirmed these rejections. The majority opinion states that the affiant's statements "that he was impressed with the novelty, did not regard the approach as being obvious and believed that the approach would not have been obvious even to try ... (are) statements (of) affiant's opinion on the ultimate legal issue and, therefore, are entitled to little weight (citations omitted)."

Regarding Dr. Cywinski's factual statements about the prior art, the opinion states:

The points made by affiant are well-taken but, to a large extent not germane to the claimed subject matter or the rejections under section 103.... (The affiant) addressed himself to the intended purpose, and, undoubtedly the actual commercial purpose, of the claimed subject matter. However, the claims are not directed to a therapeutic cardiac pacer which is to be implanted into a human body to monitor and control the heart in order to continue the life of the patient. The claims are broad enough to encompass a device for use on animals in a research laboratory

The board held:

Keller and Berkovits both disclose cardiac pacers which function in a manner similar to the appellants' pacer using an analog timer. Walsh discloses a heart stimulator wherein a digital timer is used. The motivation for using a digital timer in place of the analog timer in the Keller and

Berkovits pacers is found in Walsh where it is stated, at page 30, that digital timers provide a higher degree of accuracy as compared with analog timers.

The rejections under section 103 are predicated on replacing the analog R-C timing means in Keller and Berkovits with an equivalent digital timer; not on combining the Walsh device with the Keller or Berkovits pacer or substituting the Walsh device for the R-C timing circuit of Keller or Berkovits.... The fact that the Walsh reference makes no mention of pacing a heart or that the Walsh device does not respond to naturally occurring heart signals is immaterial. The Walsh reference is only relied on for the teaching of digital timing in an analogous environment; the other features are disclosed in Keller and Berkovits. (Emphasis added.)

The third member of the board found the affidavit sufficient to overcome the prima facie case of obviousness established by the examiner. He stated that the affiant makes "several pertinent statements which must be considered as facts because they are being made by an expert and cannot be dismissed as mere opinion." He also stated that "to say in the claims that the cardiac pacer is to be implanted in a human being to monitor and control the heart for the purpose of sustaining life would be, in my opinion, redundant."

*424 OPINION

Appellant does not argue that any features of the rejected claims other than the use of digital timing are not disclosed in Keller and Berkovits. Thus, the sole issue regarding the prior art rejections is essentially whether the references, taken collectively, would have suggested the use of digital timing in a cardiac pacer to those of ordinary skill in the art at the time the invention was made.[FN10]

FN10. Miniaturization of the physical size of the circuitry used in a cardiac pacer, the use of integrated circuit techniques in such circuitry, the elimination of hand-wired circuit interconnections in such circuitry, and so forth are not in issue. These features are not claim limitations. Moreover, appellant admits that

... integrated circuits were used in analog pacers and an integrated circuit amplifier was incorporated in the first digitally timed cardiac pacer made by Cordis Corporation The choice between analog timing and

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digital timing was thus made largely independently of the move to integrated circuits.

Appellant argues essentially three points:

- (1) the teachings of Walsh cannot properly be combined with those of either Keller or Berkovits because Walsh does not relate to a cardiac pacer;
- (2) if the digital timing circuitry taught by Walsh is incorporated in either the Keller pacer or the Berkovits pacer, the resulting structure would not fairly meet the claims in issue; and
- (3) the board did not "accord appropriate weight to" Dr. Cywinski's affidavit, but rather "completely set aside", "disregarded", and "ignored" his statements therein.

Definition of Cardiac Pacer

The claims are directed to cardiac pacer apparatus. A cardiac pacer is defined as:

... a device designed to stimulate, by electrical impulse, contractions of the heart muscle at a certain rate; used in absence of normal function of the sino-atrial node; it may be connected from the outside or implanted within the body. ([FN11])

FN11. Dorland's Illustrated Medical Dictionary 1080-81 (24th ed. 1965), defining "pacemaker." This definition is carried forward in the subsequent edition, Dorland's Illustrated Medical Dictionary 1117-18 (25th ed. 1974), and augmented with examples of external types and implanted types of pacers.

On its face, Keller relates to a cardiac pacer which is implanted within the body. On its face, Berkovits relates to a cardiac pacer which is not implantable within the body, but rather is connected from the outside of the patient's body. Appellant admitted below that "(b)oth the Keller '596 patent and the Berkovits '990 patent disclose cardiac pacers ...," and asserted that these patents "represent conventional thinking with respect to cardiac pacing at the time the present invention was made." Appellant admitted further that "the Keller et al and Berkovits devices are true interactive cardiac pacers" Thus, the term "cardiac pacer" encompasses both implantable and non-implantable devices. Therefore, the words "cardiac pacer apparatus" used in the rejected claims are broad enough to read on a device for humans which is not implanted.[FN12]

FN12. Dr. Cywinski, who indicated that he

was familiar with the pacers "disclosed and claimed" in Keller and in Berkovits, stated: "A cardiac pacer is implanted in the human body to" We note Dr. Cywinski did not state that a device cannot be a cardiac pacer if it is not implanted in the human body, and we further note that, based on his familiarity with the pacer disclosed and claimed in Berkovits (which is not implantable), he could not have intended his testimony to be so construed.

Walsh Relates to Analogous Art

[1] Contrary to the position advanced by appellant on appeal, Keller and Berkovits are the principal references relied on by the examiner in his rejections. [FN13] Walsh is the secondary reference. The board correctly noted that Walsh is relied on only for the teaching of digital timing in an analogous environment.

<u>FN13.</u> Appellant, at page 6 of his main brief, states: "... the type described in the principal reference, the Walsh et al article."

Appellant "strongly emphasizes" that Walsh "is not about cardiac pacing"; and that the device taught by Walsh is an investigatory *425 device used in the study of a mammalian heart rather than a therapeutic device used in the treatment of a living human (which, of course, has a mammalian heart).

Walsh discloses a heart stimulator used in studies of the atrioventricular conduction system of a mammalian heart. A stimulator used in studies of the atrioventricular conduction system of a mammalian heart is not so non-analogous to a stimulator used to pace a mammalian heart that it should be ignored. Accordingly, Walsh may be combined with either Keller or Berkovits. In re Menough, 51 CCPA 741, 323 F.2d 1011, 139 USPQ 278 (1963).

Appellant further argues that Walsh does not relate to a cardiac pacer because Walsh teaches a stimulator which is used in conjunction with an oscilloscope, and which has a multiplicity of multiple position switches that are operator controlled. As discussed above, Berkovits discloses a cardiac pacer which may be used in conjunction with an oscilloscope, and which has a multiplicity of multiple position switches as well as other variable circuit elements that are operator controlled. Thus, the argument that such features render Walsh unrelated to a cardiac pacer is without merit.

(Cite as: 642 F.2d 413)

Combining Walsh with Keller or Berkovits

[2][3] To justify combining reference teachings in support of a rejection it is not necessary that a device shown in one reference can be physically inserted into the device shown in the other. In re Griver, 53 CCPA 815, 354 F.2d 377, 148 USPQ 197 (1966); In re Billingsley, 47 CCPA 1108, 279 F.2d 689, 126 USPQ 370 (1960). The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. In re Wood, 599 F.2d 1032, 202 USPQ 171 (CCPA 1979); In re Passal, 57 CCPA 1151, 426 F.2d 828, 165 USPQ 720 (1970); In re Richman, 57 CCPA 1060, 424 F.2d 1388, 165 USPQ 509 (1970); In re Rosselet, 52 CCPA 1533, 347 F.2d 847, 146 USPQ 183 (1965).

Both Keller and Berkovits disclose heart stimulators that use R-C type timing circuits. Walsh teaches the use of digital type timing circuits in place of R-C type timing circuits in conventional heart stimulators. Therefore, the question is whether it would have been obvious to one of ordinary skill in the art, working with the Keller and the Berkovits and the Walsh references before him, to do what the inventors herein have done, that is, to use a digital timing circuit in a cardiac pacer. In re Winslow, 53 CCPA 1574, 365 F.2d 1017, 151 USPQ 48 (1966), as modified by In re Antle, 58 CCPA 1382, 444 F.2d 1168, 170 USPQ 285 (1971). We agree that the references establish a prima facie case of obviousness.

The Cywinski Affidavit

Once a prima facie case of obviousness was established below, the burden shifted to appellant to rebut it, if he could, with objective evidence of non-obviousness. In re Fielder, 471 F.2d 640, 176 USPQ 300 (CCPA 1973). Appellant attempted to do so by introducing the Cywinski affidavit. Both this court and the PTO must give full consideration to that evidence and render a decision based on the relative strength of appellant's showing and the prima facie case established by the references. In re Saunders, 58 CCPA 1316, 444 F.2d 599, 170 USPQ 213 (1971).

Appellant's showing below "may well shift the burden of proof to the examiner to then come forward

with further support for his conclusion that the invention would be obvious under the conditions stated in section 103." In re Katzschmann, 52 CCPA 1497, 1500, 347 F.2d 620, 622, 146 USPQ 66, 68 (1965). (Emphasis added.) Whether appellant's showing does shift the burden of proof, however, must be determined on a case by case basis.

As characterized by appellant, the Cywinski affidavit offered as objective evidence of non-obviousness "concerns itself mainly *426 with the question of whether the Walsh et al article suggest (sic) the use of digital timing in a cardiac pacer" But one cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references. In re Young, 56 CCPA 757, 403 F.2d 754, 159 USPQ 725 (1968). Moreover, as set forth above, the test is not whether a suggestion to use digital timing in a cardiac pacer is found in Walsh (which was the test applied by Dr. Cywinski), but rather what Keller in view of Walsh and what Berkovits in view of Walsh would have suggested to one of ordinary skill in the art.

Contrary to the position advanced by appellant, <u>In re Carroll</u>, 601 F.2d 1184, 202 USPQ 571 (CCPA 1979) is not "nearly 'on fours' with the present factual situation."

In Carroll this court concluded that the opinion of an expert on what the prior art taught was deserving of considerable deference under the circumstances of that case. The expert had critically reviewed the sole piece of prior art and totally discounted its value. The accuracy of the expert's views was supported by documentary evidence.

In the present case, we are not presented with a single prior art reference, but rather two combinations of three references: Keller in view of Walsh, and Berkovits in view of Walsh. The affidavit does not indicate that Dr. Cywinski critically reviewed the use of digital timing in a cardiac pacer as prima facie established by the two combinations of references. Consequently, Dr. Cywinski's opinion on the ultimate legal question of obviousness is entitled to little weight.

Section 103 Rejections are Affirmed

The board considered Dr. Cywinski's testimony and accorded it due weight. We are satisfied that the record herein contains sufficient evidence to support the board's decision. Accordingly, we affirm the decision of the board regarding the s 103 rejections.

Requirements of Reissue Declaration

Turning to the rejections under 35 U.S.C. s 251, we note that a reissue declaration, defective in the nature alleged herein, is correctable in the PTO by the filing of a supplemental oath or declaration.

A reissue oath or declaration filed under 37 CFR 1.175 subsection (a)(4) must also comply with both subsections (a)(5) and (a)(6).[FN14] Subsection (a) of section 1.175 sets forth requirements relating to the content of a statement which must be filed by the applicant with his reissue application. Subsection (a)(4), which requires the applicant to particularly specify the prior art or other information relevant to patentability and not previously considered by the PTO, which might cause the examiner to deem the original patent wholly or partly inoperative or invalid, therefore requires the prior art or other information to be specified in that statement.

FN14. See note 4, supra.

In the present case, the reissue declaration purported to incorporate by reference a paper entitled "citation to prior art" on which the prior art being brought to the attention of the PTO by the applicant was delineated. The question before this court, therefore, is whether the citation of prior art was successfully incorporated by reference into the declaration.

Subsection (a) of section 1.175 requires the statement to be made by the applicant under oath or declaration. This statement, therefore, (1) must be subscribed to by the applicant, and (2) must either (a) be sworn to or affirmed by the applicant as provided in 37 CFR 1.66, or (b) include the personal declaration of the applicant as prescribed in 37 CFR 1.68. See 37 CFR 1.65(a) (2).

[4] In the present case, the declaration per se was subscribed by the applicant and included an appropriate personal declaration of the applicant. The citation of prior art was not subscribed by the applicant and did not include the personal declaration of the applicant. Rather, the citation of prior art was subscribed by applicant's attorney. And, while the citation of prior art is dated *427 one day earlier than the declaration, there is no evidence in the record that applicant even saw the citation of prior art at the time the declaration was executed.

Accordingly, we affirm the decision of the board regarding the rejections of claims 1, 2, 6, 7, and 9-16

under 35 U.S.C. s 251 because the declaration does not comply with 37 CFR 1.175(a)(4).

As to the rejections on grounds relating to <u>37 CFR</u> <u>1.175(a)(5)</u> and (a)(6), we do not agree with the board.

Subsection (a)(5) requires the applicant to specify "the errors or what might be deemed to be errors relied upon, and how they arose or occurred." Subsection 1414.03 of the Manual of Patent Examining Procedure (MPEP) (4th ed., Rev. 1, Jan. 1980) [FN15] states that to comply with the requirements of subsection (a)(5) in a s 1.175(a)(4) type reissue, the reissue declaration

FN15. We note that MPEP chapter 1400, the chapter dealing with reissue applications, has been completely revised in the fourth edition and now includes detailed instructions regarding, inter alia, reissue declarations.

might state that some or all claims might be deemed to be too broad and invalid in view of references X and Y which were not of record in the patent files. Usually, a general statement will suffice. * * * (The reissue declaration) must indicate when and the manner in which the reissue applicant became aware of the prior art or other information....

MPEP s 1401.08 (3rd ed., Rev. 54, Oct. 1977) merely stated:

The reissue oath or declaration must point out very specifically what the defects are and how the errors arose.

[5] Applicant's reissue declaration contains a passage (which we have numbered "1" in the quoted declaration) that is remarkably close to what subsequently appeared in the fourth edition of the MPEP with respect to the content of a declaration for this purpose. We hold on the facts of this case that the declaration fairly meets the requirements of 37 CFR 1.175(a)(5).

Subsection (a)(6) requires the applicant to state that said errors, if any, arose without deceptive intention on the part of the applicant. The passage in the declaration which we have numbered "3" fairly meets this requirement.

CONCLUSION

Accordingly, the decision of the board regarding the rejections of claims 1, 2, 6, 7, 9-11, 13, and 14 based on the prior art is affirmed, the decision of the board regarding the rejections of claims 1, 2, 6, 7, and 9-16 based on <u>37 CFR 1.175 subsection (a)(4)</u> is affirmed, and that based on subsections (a)(5) and (a)(6) is reversed.

MODIFIED.

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642 F.2d 413, 208 U.S.P.Q. 871

END OF DOCUMENT



509 F.2d 566. 509 F.2d 566, 184 U.S.P.Q. 607 (Cite as: 509 F.2d 566)

United States Court of Customs and Patent Appeals.

Application of Kosei NOMIYA et al.

Patent Appeal No. 74--514.

Feb. 6, 1975.

An appeal was taken from decision of the Patent Office Board of Appeals which affirmed the rejection of claims 1--8 and 33 in application serial No. 768,794. The Court of Customs and Patent Appeals, Rich, J., held that claims 1--8 and 33 pertaining to insulated gate-type field-effect transistors and their use in semiconductor capacitive memory circuits having very low capacitance were improperly rejected for obviousness.

Reversed.

West Headnotes

[1] Patents \$\insigma_{16(2)}\$

291k16(2) Most Cited Cases (Formerly 291k18)

(Formerly 291k18

291k51(1) Most Cited Cases

Applicants' representations in their application could be accepted at face value as admissions that figs. 1 and 2 could be considered "prior art" for any purpose, including use as evidence of obviousness, and fact that invention may have been made in Japan was of no consequence in light of admissions. 35 U.S.C.A. § § 102, 103.

[2] Patents \$\infty\$ 16.5(4)

291k16.5(4) Most Cited Cases

(Formerly 291k16.9, 291k18)

A patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. 35 U.S.C.A. § 103.

[3] Patents \$\infty\$ 16(1)

291k16(1) Most Cited Cases

(Formerly 291k18)

Court must not read obviousness into an invention on the basis of applicant's own statements; that is, court must view prior art without reading into that art applicant's teachings. 35 U.S.C.A. § 103.

[4] Patents 16(3)

291k16(3) Most Cited Cases

(Formerly 291k18)

There must be a reason, apparent at time invention was made, to person of ordinary skill in the art for applying the teaching at hand, or the use of the teaching as evidence of obviousness will entail prohibited hindsight. 35 U.S.C.A. § 103.

[5] Patents \$\infty\$ 16.29

291k16.29 Most Cited Cases

(Formerly 291k18)

Claims 1-8 and 33 pertaining to insulated gate-type field-effect transistors and their use in semiconductor capacitive memory circuits having very low capacitance were improperly rejected for obviousness. 35 U.S.C.A. § 103.

Patents \$\infty 328(2)

291k328(2) Most Cited Cases

3,408,511. Cited as prior art.

*566 Paul M. Craig, Jr., Washington, D.C., attorney of record, for appellants.

Joseph F. Nakamura, Washington, D.C., for the Commissioner of Patents; R. V. Lupo, Washington, D.C., of counsel.

Before MARKEY, Chief Judge, and RICH, BALDWIN, LANE and MILLER, Judges.

RICH, Judge.

This appeal is from the decision of the Patent Office[FN1] Board of Appeals affirming the rejection under 35 U.S.C. s 103 of claims 1--8 and 33 in application serial No. 768,794, filed October 18, 1968, for 'Semiconductor Circuit Devices Using Insulated Gate-Type Field Effect Elements Having Protective Diodes.' We reverse.

FN1. Pub.L. 93--596, effective January 2, 1975, changed the names of the Patent Office and the Commissioner of Patents to the 'Patent and Trademark Office' and the 'Commissioner of Patents and Trademarks,' respectively. For convenience and brevity hereinafter we shall use the abbreviation PTO.

The Invention

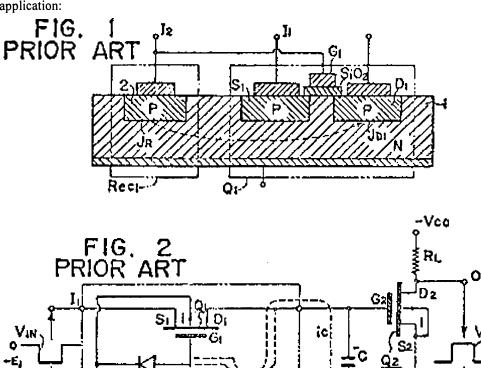
Appellants' invention pertains to insulated-gate-type field-effect transistors (hereinafter IGFET) and their use in *567 semiconductor capacitive memory

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circuits having very low capacitance. For ease of discussion we reproduce Figs. 1 and 2 of the application:



The structure of Q1 in Fig. 1 is an IGFET, consisting of two P-type[FN2] regions, S1 and D1, diffused into an N-type starting crystal, or substrate, usually of silicon, with an insulating oxide layer SiO2 formed on the surface of the N-type substrate and contacting the diffused P-type regions. A metal gate electrode G1 is attached to the insulating layer. IGFETs used as switching devices, as contemplated by appellants, are customarily fabricated in the OFF-mode. In this mode, when no voltage is applied to the gate, the two P-type regions, called source (S1) and drain (D1), are electrically insulated from each other by the N-type region surrounding them. However, when a negative voltage, such as a clock pulse, is applied to the gate, the electric field so produced induces a thin P-type channel across the surface of the N-type channel across the surface of the N-type region connecting the source and the drain, permitting a current to pass between them. See In re Carlson, 412 F.2d 255, 56 CCPA 1309 (1969). Fig. 2 is a circuit diagram of a dynamic shift register employing the IGFET device of Fig. 1 *568 as a switch to control a bit of information stored in capacitor C, which may be distributive capacitance of the circuit.

FN2. A P-type semiconductor contains more holes, or electron gaps in the lattice of the material, than it does electrons free of covalent bonds in the lattice. An N-type material has an excess of free electrons over holes. These electrons and holes are referred to as 'carriers'; 'minority carriers,' mentioned infra, are electrons in P-type semiconductors and holes in N-type semiconductors.

According to the application,

* * * since the gate G1 of an insulated gate-type field effect transistor Q1 as shown in Figure 1 has a high capacitive input impedance, a very small amount of electric charge accumulated on the gate G1 induces a high voltage and sometimes causes the insulating film (usually silicon dioxide) between the gate G1 and semiconductor substrate 1

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to break down. Therefore, it has been proposed that a protective diode be formed, i.e. a zener diode Rec1, integrally in the semiconductor body 1 and that the diode be connected in parallel with the gate G1 as shown in Figure 1. It has been believed that the protective diode could prevent the insulating film from breakdown without interfering with the characteristics of the field effect transistor.

Appellants claim to have discovered that when IGFETs having protective diodes formed in the same substrate, as shown in Fig. 1, are used as switches for storing information or input signals in a memory element having very small capacitance (C on Fig. 2), parasitic transistor action between the protective diode and the drain region may take place when the PN junction JR of the protective diode Rec1 is forward biased[FN3] by a noise signal, causing the signal stored in the memory element to discharge through the drain region D1 despite the lack of a pulse applied to the gate electrode. The solution to this problem found by appellants, which they claim as their invention, is a voltage-limiting means auxiliary to the protective diode, which can be a high resistance or another protective diode (hereinafter called 'shunt diode'), formed outside the substrate or electrically isolated from other circuit elements on the substrate, connected in parallel with and in the same direction as the protective diode Rec1.

<u>FN3.</u> 'Forward bias' is the application of a potential difference to a P--N junction in the direction which aids current flow across the junction.

Claim 1, with reference letters keyed to Fig. 1 and emphasis supplied, is illustrative:

1. In a semiconductor device comprising: an insulated gate-type field effect component (Q1) including a semiconductor substrate (1) of first conductivity type, source (S1) and drain (D1) regions of second conductivity type opposite to said first conductivity formed in a surface of said semiconductor substrate, and an insulated gate electrode (G1) disposed on said surface between said source and drain regions and insulated from said substrate by an insulating film (SiO2); and a protecting semiconductor diode (Rec1) formed integrally in said substrate and connected in parallel between said insulated gate electrode and said semiconductor substrate for protecting the insulating film interposed between said gate electrode and said substrate from breakdown; the improvement comprising auxiliary means connected with said semiconductor

device for preventing minority carriers from said protecting semiconductor diode from reaching said drain region through said semiconductor substrate when noise signals are applied to the protecting diode.

Claim 2 is similar to claim 1 and is cast in the same 'Jepson' form. Dependent claims 3--8 depend from claim 2 and recite various added limitations. Claim 33 defines a 'memory circuit device' containing appellants' invention. If claim 1 is patentable, so are the other claims.

The Rejection

The examiner cited Bergersen et al. (Bergersen) U.S. patent 3,408,511, issued October 29, 1968 on an application filed May 13, 1966. The Bergersen specification states in part:

This invention relates to an improved insulated-gate field-effect transistor (IGFET) circuit having large bipolarity *569 voltage capabilities. This circuit is operative as an active component of an electronic chopper or an electronic analog switching circuit and is adapted to receive large bipolarity analog input signal voltages.

When an insulated-gate field-effect transistor is used in analog switching or chopper circuits, it must be voltage controlled in such a manner that the P--N junctions between semiconductor substrate and source regions and between semiconductor substrate and drain regions do not become forward biased and enable current to flow from either the substrate region to the source region or from the substrate region to the drain region, respectively. This requirement means that the insulated-gate field-effect transistor can only handle input signals of a limited amplitude if these signals are connected directly in parallel with either of the above defined P--N junctions and between one of the source or drain regions and the substrate region, which is usually at ground potential. If, using the above-described connection, the input signals applied across either of the P--N junctions would be at a voltage level sufficiently high to forward bias these P--N junctions into conduction, then an alternative input signal connection must be One such alternative connection resorted to. involves disconnecting the substrate region from its ground return and from the source of input signals, leaving the substrate region floating. This mode of IGFET operation will prevent the P--N junctions between substrate and source regions and between substrate and drain regions from becoming forward biased, but it will also subject the substrate region

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to extraneous noise pickup and this is obviously an undesirable compromise for enabling the insulated-gate field-effect transistor to handle large bipolarity signals connected between either source or drain and substrate regions.

A feature of this invention is the provision of an field-effect transistor insulated-gate circuit including adjacent source, substrate and drain regions with a P--N junction between the substrate and source regions and a P-- N junction between the substrate and drain regions. A voltage limiting circuit is connected to the substrate region and includes a diode which is connected between the substrate region and either the source or the drain region. This diode becomes conductive for large amplitude signals of one polarity which are applied to one of the source or drain regions and thereby protects one of the above-identified P--N injunctions from becoming forward biased. When large amplitude input signals of an opposite polarity are applied to the same source or drain region, this diode becomes reverse biased and prevents the input signals from reaching the other of the two P--N junctions, and forward biasing this iunction.

The substrate region * * * and the source and drain regions * * * are analogous to two spatially separated diodes connected back to back. Since the source and drain regions * * * are isolated by the substrate region * * * any drain to source current or source to drain current in the absence of a gate voltage is extremely low. The P--N junctions * * * of the so-called back to back diodes defined above must not be allowed to become forward biased for any amount of channel conduction since this would cause extraneous currents to flow to the input and output circuits of a practical chopping or switching device * * *.

It is significant that Bergersen does not explicitly disclose a protective diode formed in the same substrate as the IGFET so protected.

In order to understand one of appellants' arguments, we must look to the PTO position as it developed. In his *570 first rejection of the appealed claims the examiner said:

Applicant's (sic) figures 1 and 2 (reproduced supra) illustrate the prior art. Bergersen et al teach the prevention of a diffused N region in a P substrate from being biased in the forward direction by the input signals through the use of a shunt diode and a resistor. Pursuant to this teaching it is obvious to one of ordinary skill in the art to prevent any of the diode junctions of Applicant's (sic) prior art figures

from becoming forward bias (sic) through the use of a shunt diode. No new novel or unexpected result is seen to occur by so doing.

The Examiner's Answer on appeal states that 'Applicant's (sic) figure 1 shows the prior art,' and concludes:

In the prior art diode protected IGFET the protection diode is usually used to prevent spurious signals, i.e. noise from damaging the gate insulator. Noise is usually bipolar. As such it is rather apparent that the noise signal will forward bias the prior art protection diode. Thus the prior art protection diode is known to operate on bipolar signals, both positive and negative, otherwise only half the protection for the gate insulator would be present. Bergersen et al disclose that noise signals will undesirably forward bias junctions of an IGFET. Forward biased junctions in IGFET'S are undesirable as they create leakage currents between the input and output. The solution to the problem as per Bergersen et al. is to prevent the junction from becoming forward biased by shunting the junction with a diode of lower threshold voltage. Pursuant to this teaching it is obvious to one of ordinary skill in the art to add a shunt diode across the protection diode of the prior art that becomes forward biased during half of the protection function. No new, novel, or unexpected results are seen to occur by so doing. Germanium diodes are well known to have a lower threshold voltage than silicon diodes, thus being an obvious design choice to use in the application of the teachings of Bergersen et al.

The board adopted the examiner's reasoning and added some of its own, stating:

We find it logical to apply the teaching of Bergersen et al. to any junction on a single chip. One skilled in the art having studied Bergersen et al. and looking at appellants' Figure 1 would realize and understand that a diode provided purely for gate protection which is integrated into the same chip as the FET might be a source of undesired minority carrier injection from forward biasing in the same way as the source or drain in a field effect transistor as described by Bergersen et al.

We have no doubt that the examiner is relying on the admitted prior art of Figures 1 and 2 of appellants' drawing. We agree with appellants that the dotted line showing of the transistor action resulting from the forward biasing of the protective diode as depicted in Figure 2 should not be considered as prior art. The dotted line showing (Cite as: 509 F.2d 566)

clearly represents appellants' contribution and in our opinion the examiner has so construed it.

OPINION

Appellants' brief now questions the PTO's use of Figs. 1 and 2 of their application as 'prior art' under 35 U.S.C. s 103, arguing that there is no statutory basis for considering Figs. 1 and 2 to be 'prior art' in the s 103 sense. The oath in the application shows that appellants are citizens and residents of Japan; presumably the invention was made in Japan. Appellants point out that what may have been known to them in Japan would not be prior art by virtue of any portion of 35 U.S.C. s 102.

[1] We see no reason why appellants' representations in their application should not be accepted at face value as admissions that Figs. 1 and 2 may be *571 considered 'prior art' for any purpose, including use as evidence of obviousness under s 103. In re Garfinkel, 437 F.2d 1000, 1004, 58 CCPA 883, 887 (1971); In re Hellsund, 474 F.2d 1307, 1311, 59 CCPA 1382, 1387 (1973). [FN5] By filing an application containing Figs. 1 and 2, labeled prior art, ipsissimis verbis, and statements explanatory thereof[FN6] appellants have conceded what is to be considered as prior art in determining obviousness of their improvement. That appellants' invention may have been made in Japan is of no consequence in light of their admission.

> FN5. Although the author of this opinion did not join the opinion of the court in Hellsund, there was no disagreement among the members of the court with the basic proposition that a statement by an applicant, whether in the application or in other papers submitted during prosecution, that certain matter is 'prior art' to him, is an admission that that matter is prior art for all purposes, whether or not a basis in s 102 can be found for its use as prior art. The point of controversy in Hellsund was not whether a binding admission had been made, but what was admitted. The opinion of the court called it an admission of 'prior art,' but the author of this opinion found it to be an admission merely that the Opel patent contained a disclosure of an invention made prior to Hellsund's invention.

> <u>FN6.</u> The application contains a section entitled 'Description of the Prior Art,' which explains Figs. 1 and 2 in detail. We note

also that appellants, in an amendment to the application and in their briefs on appeal to the board, repeatedly acknowledged that Figs. 1 and 2 illustrate the prior art.

It is necessary to consider everything appellants have said about what is prior art to determine the exact scope of their admission. The relevant portion of the specification under the heading 'Description of the Prior Art' states:

According to investigation, however, it has been revealed that since the PN junction JR of the diode Rec1 is biased in the forward direction by noise pulses eN, a bipolar transistor is formed (with) the region 2 (as an emitter), the substrate 1 (as a base) and the drain region D1 of the field effect transistor Q1 (as a collector) since the junction JD1 is usually biased in the backward direction. Minority carriers injected into the substrate 1 from the diode region 2 diffuse in the substrate 1 and reach the drain region D1, as shown by the broken line arrow in Figure 1. (Emphasis added.)

The board in its opinion, supra, conceded that the bipolar transistor action described by appellants in the passage above quoted was not part of the admitted prior art. [FN7] Therefore, on this record, the admission is only that the structure shown in Figs. 1 and 2 combining an IGFET and its protective diode in a common substrate and the use of that structure in a dynamic shift register circuit were known to the art when appellants invented their improvements.

<u>FN7.</u> It is clear from the specification that the dotted line of Fig. 2 referred to by the board represents the same phenomenon as the 'broken line arrow' on Fig. 1.

[2][3] What we said in <u>In re Sponnoble</u>, 405 F.2d 578, 585, 56 CCPA 823, 832--833 (1969), is relevant here:

It should not be necessary for this court to point out that a patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified. This is part of the 'subject matter as a whole' which should always be considered in determining the obviousness of an invention under 35 U.S.C. s 103. In re Antonson, 272 F.2d 948, 47 CCPA 740; In re Linnert, 309 F.2d 498, 50 CCPA 753. The court must be ever alert not to read obviousness into an invention on the basis of the applicant's own statements; that is, we must view the prior art without reading into that art appellant's teachings. In re Murray, 268 F.2d 226, 46 CCPA

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905; In re Sporck, 301 F.2d 686, 49 CCPA 1039. The issue, then, is whether the teachings of the prior art would, in and of themselves and without the benefits of appellant's disclosure, make the invention as a whole, *572 obvious. In re Leonor, 395 F.2d 801, 55 CCPA 1198.

See also <u>In re Conover</u>, 304 F.2d 680, 49 CCPA 1205 (1962). Appellants' specification identifies the problem discovered by them in part as follows:

The emitter common current amplifier factor of this transistor structure (Fig. 1) is in the order of 10-3 to 10-4. This factor of the transistor structure is much smaller than those of usual bipolar transistors (in the order of several tens to several hundreds). Therefore, the parasitic bipolar transistor seems to be of negligible value because of the extremely small current amplifier factor.

When an insulated gate-type field effect transistor having a protective diode is used as a control switch for storing an information signal or an input signal in a memory element having very small capacitance, the parasitic bipolar transistor, according to our study, cannot be neglected even if the current amplifier factor is extremely small as aforementioned. * * *

Since the zero voltage level part of the pulse VCP, however, often includes a noise signal eN(Fig. 2) which comprises high frequency components of fairly large amplitude, * * * the diode Rec1 is biased in the forward polarity by the noise signal Only in this instant, a parasitic bipolar transistor Q3 is constructed, the collector current iC flows through the transistor Q3 and the capacitor C in spite of the OFF-state of the transistor Q1. Therefore the stored charge in the capacitor C discharges. Especially in such a memory circuit device as that which uses a capacitive memory element of very little capacitance an extremely small amount of collector current iC of the parasitic transistor Q3 causes the (charge) stored in the capacitor C to be reduced considerably since the amount of the stored charge is very small, and it results in misoperation of the memory circuit device.

If, as appellants claim, there is no evidence of record that a person of ordinary skill in the art at the time of appellants' invention would have expected the problem in the IGFET to exist at all, it is not proper to conclude that the invention which solves this problem, which is claimed as an improvement of the prior art device, [FN8] would have been obvious to that hypothetical person of ordinary skill in the art. The significance of evidence that a problem was

known in the prior art is, of course, that knowledge of a problem provides a reason or motivation for workers in the art to apply their skill to its solution. Logically, the instant situation is one step removed from the circumstances illustrated by <u>Eibel Process Co. v. Minnesota & Ontario Paper Co., 261 U.S. 45, 67-68, 43 S.Ct. 322, 67 L.Ed. 523 (1923)</u>, where the problem of rippling in paper produced on Fourdrinier paper-making machines at high speed was known, but the source of the problem was not.

FN8. The matter in claim 1 before the word 'improvement' reads on Fig. 1, supra. By using this 'Jepson' form, appellants are relying solely on the subject matter following 'improvement' to provide patentable distinction over the prior art.

Thus, we must first ask the question: does Bergersen, when considered in conjunction with the prior art structures disclosed in Figs. 1 and 2, suggest the existence of the problem solved by appellants? We think not. While we agree with the PTO that Bergersen supplies the obvious expedient of using voltagelimiting means to prevent the injection of minority carriers (i.e., extraneous currents) from a forward-biased PN junction of the IGFET into the IGFET substrate, we find nothing in Bergersen which, when applied to a structure having a protective diode disposed in a common substrate with an IGFET and not insulated electrically therefrom, is evidence that a person of ordinary skill in the art would have recognized that the misoperation of IGFET memory elements employing such a protective diode was caused by forward biasing of the PN junction, not of the IGFET, but of *573 the protective diode. Bergersen, in fact, is better evidence for the conclusion that a person of ordinary skill in the art would consider that the protective diode Rec1 of Fig. 1 would prevent injection of minority carriers into the IGFET substrate, not be a cause thereof.

[4] The board attempted to overcome the lack of nexus between Bergersen's teachings and the structure of Fig. 1 by saying that 'it (is) logical to apply the teachings of Bergersen et al. to any junction on a single chip.' There must, however, be a reason apparent at the time the invention was made to the person of ordinary skill in the art for applying the teaching at hand, or the use of the teaching as evidence of obviousness will entail prohibited hindsight. Graham v. John Deere Co., 383 U.S. 1, 36, 86 S.Ct. 684, 15 L.Ed.2d 545 (1966). From the portion of Bergersen quoted supra, it appears that the single protective diode of Bergersen would protect

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one IGFET PN junction from becoming forward biased when signals of a particular polarity are applied to the source or drain region of the IGFET, and would protect the other PN junction when signals of the reverse polarity are applied. While this teaching is available to show that any PN junction may be protected from forward bias by a shunt diode, it does not suggest a problem, or the solution thereto, concerning an IGFET with a protective diode formed in the same substrate in the absence of knowledge that forward bias on the protective diode causes parasitic transistor action or other undesirable phenomena between the PN junction of the protective diode and the source-substrate or substrate-drain PN junction of the IGFET. Parasitic transistor action for the IGFET use contemplated by appellants was a significant source of faulty operation. The board recognized that appellants contributed knowledge.

The solicitor's argument begs the question:

While it may be true that appellants were the first to recognize and describe the existence of a 'parasitic bipolar transistor,' that recognition and description, while a professional credit to appellants, is not sufficient to establish the patentability of the claims. After all, what causes the existence of the parasitic bipolar transistor in appellants' system is the forward biased P--N Junction--the same problem recognized in the Bergersen patent.

It is, of course, not the same problem since Bergersen makes no suggestion that bipolar transistor action might occur when the protective diode and IGFET are formed in a common substrate.

[5] On this record, therefore, we find no evidentiary basis for the finding that a person of ordinary skill in the art would have had reason to apply an additional shunt diode (or other voltage-limiting means) to an IGFET already equipped with a protective diode formed in the same substrate.

The rejection of claims 1--8 and 33 is reversed.

Reversed.

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